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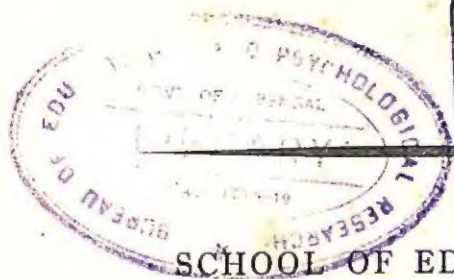
EDUCATIONAL REVIEW

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DOGMATISM AND VIEWS OF THE 'IDEAL PUPIL'

A Study of Mature Student-Teachers

by LOUIS COHEN

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I. INTRODUCTION

YAMAMOTO'S (1969) observation that individual teachers not only bring to the classroom their unique expectations and stereotypes of children but also tend to *behave* towards pupils according to these 'prejudged images', received substantial confirmation in a well-planned study by McGee (1955).

McGee demonstrated a highly significant relationship between personality measures of teachers' authoritarianism towards pupils and the overt authoritarian behaviour of the same teachers within their respective classrooms.

The present study is concerned with dogmatism, a particular form of authoritarianism, and its relationship to the stereotypic views of ideal pupils that are held by intending teachers.

The dogmatic teacher has been characterized as lacking in open-mindedness and intolerant of ambiguity, a condition which one observer has described as 'fatal to both the afflicted teacher and the exposed pupil.' (Soderbergh, 1964.)

At a time when teacher training in Great Britain is under public and official scrutiny, the findings reported here have implications both for the initial selection of teachers and for the design and content of their professional studies.

2. SAMPLE

102 mature female student teachers (mean age = 34.1 years; s.d. 7.49) at a northern college of education following professional courses to equip them to teach younger children in the 5-9 years

age range constituted the sample in the present study. They represented 74% of a total population of 138 students specializing in infant and early junior work at the college. The students were invited to respond (anonymously) to two questionnaires intended to elicit the openness or closedness of their belief systems and their views of the ideal pupils whom they would like to have in their classes.

3. MEASURES

(1) *Rokeach (1960) Dogmatism Scale (Form E)*

The Rokeach Scale is a well-established technique for evaluating the structure and the intensity of a person's political, religious and social beliefs, together with his views of himself as a person ('If given a chance I would do something of great benefit to the world', 'My blood boils whenever a person stubbornly refuses to admit he's wrong'.)

The 40-item scale gives scores ranging from 40 to 280, higher scores indicating dogmatism or closed-mindedness.

(2) *Torrance (1965) Ideal Pupil Check List*

The Torrance checklist consists of 62 statements of pupil characteristics ('willing to take risks', 'fault-finding', 'a good guesser', 'always asking questions' etc.) together with a scale of desirability. Respondents rated those characteristics which they regarded as desirable or undesirable in the ideal pupils whom they would like to have in their classes.

The 62 characteristics were randomly-varied from the alphabetized ordering in Torrance (1965).

4. RESULTS

Table 1 shows that the average dogmatism score of the mature female student teachers was not significantly different from that found in a younger female student teacher group also training to teach in the 5-9 years age range. (Cohen 1971.) Furthermore, Table 1 shows no support for Soderbergh's (1964) claim that older teachers tend to be excessively dogmatic. The present findings are in line with those reported by Rabkin (1966) who found no relationship between age and dogmatism in a group of female teachers whose average age (27 years) was somewhat younger than that of the present sample.

TABLE 1
Level of Dogmatism in older and younger female student-teacher groups

GROUP	N	DOGMATISM		't'	
		Mean	s.d.		
Mature student-teachers	102	142.89	23.90	.385	ns
Younger student-teachers	149	155.25	21.39		
Mature student-teachers correlation between Dogmatism and Age				r = .099	ns

5. HIGH AND LOW DOGMATISM AND VIEWS OF THE IDEAL PUPIL

The range of scores on the Rokeach Scale (96 to 219) was dichotomized at the median (138) to give a *high dogmatism* group consisting of 52 students and a *low dogmatism* group of 50.

The responses of the two groups to each item on the Torrance checklist were summated, expressed as percentages, and compared (Brown, 1956).

Table 2 shows significant differences in the degree to which high and low dogmatism groups hold specific pupil characteristics to be *highly desirable*, *desirable*, and *undesirable*.

TABLE 2
Differences in the percentage ratings by high and low dogmatism groups of highly desirable, desirable and undesirable pupil characteristics

Pupil Characteristics	High Dogmatism	Low Dogmatism	Significance of Difference
HIGHLY DESIRABLE			
obedient	35%	12%	p < .01
healthy	61%	34%	p < .01
affectionate	23%	6%	p < .01
strives for distant goals	42%	22%	p < .05
self-sufficient	20%	6%	p < .05
intuitive	37%	18%	p < .05
DESIRABLE			
willing to accept judgments of authorities	75%	54%	p < .05
prefers complex tasks	67%	44%	p < .05
quiet	29%	12%	p < .05
reserved	14%	2%	p < .05
likes to work alone	35%	16%	p < .05
popular, well-liked by peers	78%	56%	p < .05
UNDESIRABLE			
regresses occasionally	25%	10%	p < .05

The discrepancies in the ratings of ideal pupil behaviour by which high and low dogmatic student teachers are differentiated in Table 2 are suggestive of differences that students may eventually foster and maintain (as teachers) within their own classrooms. These differences relate both to teacher relationships with pupils and to relationships between the pupils themselves.

The stronger preferences of the high dogmatic student for pupils characterized as 'obedient', 'willing to accept the judgement of authorities' and 'striving for distant goals' indicate an approach to teaching more *teacher-directed* than *pupil-directed* (Kaye 1970). Kaye's distinction between these two approaches rests upon a view of the teacher's task as essentially one of communicating a body of knowledge or one of facilitating and guiding children's natural curiosity. In the former case the most functional relationship in the communication of knowledge is one between the teacher and each individual child, with little or no interaction between the pupils. An essential aspect of pupil-directed learning however is the cooperative planning and organization that takes place among the pupils themselves under the watchful guidance of the teacher. Such ideal pupil characteristics as 'self-sufficient', 'quiet', 'reserved', 'likes to work alone', more preferred by high dogmatic students, are indicative of a *teacher-directed* rather than a *pupil-directed* classroom.

6. EXTREME DOGMATISM AND VIEWS OF THE IDEAL PUPIL

The trends in the differences between the ratings of the dichotomised student groups shown in Table 2 were further investigated by the selection of 25 student-teachers whose scores in the upper quartile range on the Rokeach measure identified them as *extreme dogmatics*. (range 169-219; mean score = 177.68 s.d. = 14.25).

In Table 3 some trends noted in the *high dogmatism* group ratings (Table 2) appear further emphasised in comparable ratings made by the *extreme dogmatism* group. *More* obedient, *more* self-sufficient pupils, *more* earnestly striving to attain distant goals, *more* ready to work alone on complex tasks, *more* readily accepting the judgment of authorities, and *less* often given to occasional regression—these are the characteristics of the ideal pupils desired by the extreme dogmatism group.

They are strongly suggestive of the rule of the traditional, formal teacher in the teacher-directed classroom.

TABLE 3

Ratings of the ideal pupil by high dogmatism and extreme dogmatism student-teacher groups

<i>Pupil Characteristics</i>	<i>High Dogmatism</i>	<i>Extreme Dogmatism</i>
	(<i>n</i> = 52: <i>Rokeach</i> 138-219)	(<i>n</i> = 25: <i>Rokeach</i> 162-219)
HIGHLY DESIRABLE		
obedient	35%	48%
healthy	61%	60%
affectionate	23%	24%
strives for distant goals	42%	60%
self-sufficient	20%	28%
intuitive	37%	36%
DESIRABLE		
willing to accept judgments of authorities	75%	84%
prefers complex tasks	67%	72%
quiet	29%	24%
reserved	14%	16%
likes to work alone	35%	44%
popular, well-liked by peers	78%	68%
UNDESIRABLE		
regresses occasionally	25%	32%

7. DISCUSSION

Probably more important correlates of a teacher's effectiveness than qualifications or length of experience are the attitudes and personality dispositions that govern her classroom relationships with children (Lunn 1967). The importance of open-mindedness, flexibility, and positive attitudes towards self in our teaching force seems incontestable. Given, however, that colleges of education will always recruit a number of potential teachers who tend towards closed-mindedness and inflexibility, a pressing issue seems to be the extent to which the more dogmatic student-teacher can be helped to modify her beliefs and classroom behaviour during the college course.

The dogmatic student-teacher

In a recent study, two counteracting variables were enunciated by Vacchiano et al. (1966), to account for the lack of relationship between dogmatism and attitude shift among experienced teachers at the completion of an intensive in-service training course. Vacchiano suggested that where the major influence upon teachers' attitudes was *the incorporation of new ideas*, a negative relationship between dogmatism and attitude shift would be expected. Conversely, a posi-

tive relationship would be predicted if an *appeal to authority* were the main influence. Since both effects were *separately* present in the structure of the particular training course the net result, the authors concluded, was a non-significant relationship between dogmatism and attitude change.

More recently still the *combined* effect of authority and appeal to new ideas was shown to be particularly effective with initially more authoritarian student-teachers (Scarr 1970). Among various sections of a Human Development and Learning course followed by 415 undergraduate education students, those sections in which relatively large attitude changes occurred among more authoritarian students were characterized by lecturer preferences for lecture rather than discussion, for more tests, and for more assigned readings.

One conclusion from the studies by Vacchiano and Scarr seems clear. It cannot be left to the more dogmatic student-teacher herself to open her mind to the many new ideas that are to be found in her professional study courses. Active, structured guidance by college staff may be a crucial factor in widening her degree of receptivity.

In so far as the classroom behaviour of the more dogmatic student-teacher is concerned, the important effect of authority figures in influencing student-teachers has been demonstrated in two studies, one British (Cohen 1969) and one American (Johnson 1969). Both reports urged that greater care be exercised when placing students with supervising teachers who tend towards authoritarianism in their classroom relationships with children.

The extremely dogmatic student-teacher

In the present study, as in a previous investigation of student-teachers (Cohen 1971), a few teacher-trainees were identified whose scores on the Rokeach measure indicate their *extreme authoritarianism*.

The authoritarian personality has been used in a number of studies as an operational definition of the 'poor' teacher and has been shown to relate both to negative attitudes towards pupils and to ineffective classroom performance (Cook, Leeds and Callis 1951; Del Popolo 1960; Ofchus and Gnagey 1963; Johnston 1967).

Despite the criticism that studies of teacher effectiveness suffer from conceptual and methodological weakness (Flanders and Simon 1969) and despite the recent finding that highly-authoritarian teachers may, under certain circumstances, be 'effective' (Weiss, Sales and Bode 1970), there are strong grounds for recommending

to college authorities that their screening and selection procedures should aim at excluding altogether extremely rigid dogmatic individuals. The latter are highly resistant to change (Rokeach 1960; Ehrlich and Lee 1969) and thus, from the college's point of view, 'bad risks'. Far better that such individuals be redirected towards a career other than teaching than that they should find their way into infant, junior, or indeed any school classrooms.

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TEACHERS' ATTITUDES TOWARDS ACCENT USAGE AND CHANGE

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ABSTRACT

In a previous study by the author, it was tentatively proposed that since regional accented speech was a potential stimulus for socially prejudiced reactions towards the speaker, an 'accent extension programme' might be considered relevant for the non-standard accented child at some appropriate and convenient stage in his educational career. The present study investigates the attitudes and reported behaviour of 60 infant and primary school-teachers towards accent usage and change—the results being discussed in the light of an accent extension programme. Some preliminary factors likely to be most important for educationalists and linguists when constructing such a project, in the event of it being considered feasible, were also discussed.

I. INTRODUCTION

GILES (1970), using Lambert's 'matched-guise' technique, presented evidence that adolescents are able to allocate social prestige values to various forms of accented speech. Standard English (RP) was found to possess a grossly superior status in relation to the British regional and industrial accents used in the study, including vocal representations of the subjects' local accent communities. Such status differentials in verbal usage are likely to afford stimulus situations for socially prejudiced reactions towards non-standard speakers of the language. Indeed, Robert Hogan in his foreword to *Nonstandard Dialect*, which briefly discusses the social implications of prestige patterns of speech, claims that the perception of non-standard linguistic forms is often one 'which can close off casual conversation among strangers, which terminate[s] job interviews, which even on the faceless telephone evoke[s] a statement that an apartment advertised as vacant was leased earlier that same day'. Thus in this context, it was tentatively suggested that at some initial stage in a child's educational career, the regional accented pupil might be oriented towards the standard code—without eliminating his

original speech habits—for use in socially appropriate, verbal situations. In other words, an attempt to foster a form of bilingualism might be considered relevant, particularly for the working-class child whose assumed lack of verbal flexibility for code-switching and 'accent mobility' in later years might then be compensated by this process.

In relation specifically to the working-class environment, it is worthwhile noting, as has Lawton (1968), that 'there is the socio-economic fact that traditional working-class socialisation processes are preparing its young members for a world which is disappearing: in the near future, routine manual jobs are going to disappear and jobs will become available in industry or in bureaucratic, welfare or distributional spheres which will require a much higher level of symbolic control'. Thus, the trend towards a transference of competence from manual to verbal and social skills will demand a hitherto unrealised flexibility in the individual's language control at all levels, including the phonological.

The aims of this article are threefold:

- (a) to determine whether infant and primary schoolteachers are sufficiently aware of the *social* 'hazards' of regional speech, and their attitudes towards its extension,
- (b) to determine if teachers of middle-class and working-class pupils are differentially disposed towards this problem, and
- (c) to discuss certain problems which would arise should an educational programme be designed to *extend* a child's accent usage.

2. METHOD

Questionnaires were sent by post and distributed among 24 infant and primary schools as follows:

- (i) '*Middle-class*' schools
 - (a) 5 questionnaires to each of 5 infant schools
 - (b) 10 questionnaires to each of 7 primary schools
- (ii) '*Working-class*' schools
 - (a) 5 questionnaires to each of 5 infant schools
 - (b) 10 questionnaires to each of 7 primary schools

The 12 so-called 'middle-class' schools existed in predominantly middle-class residential areas, with the 'working-class' schools positioned in basically lower-class catchment areas.

Each of the schools, which were all selected from the Bristol area, was sent the appropriate number of questionnaires plus the equivalent number of individual envelopes together with a large stamped addressed envelope. An accompanying letter invited the head teachers to distribute the forms and their envelopes amongst members of their teaching staff who were willing to co-operate in the scheme. It was stressed to the head teachers (and also on the individual questionnaires) that their staff's replies would be treated entirely confidentially and used only in terms of numerical group data. To this end, the names of participants and schools were not required. Teachers were requested to return the questionnaires sealed in the individual envelopes provided to the head teacher who likewise, would anonymously return the school's contribution in the stamped addressed envelope. The rationale for providing individual envelopes, and requesting participants to seal these after responding, was in an attempt to reduce the possibility of an intermediary party inspecting the replies, and so in turn minimises the frequency of 'educationally appropriate' answers. Participants could, if they preferred, return their completed questionnaires directly to the investigator whose address appeared on the questionnaire.

The questionnaires themselves were prepared untitled, and required 20 items to be completed. It was conceived that the entire form could be easily completed within 10 minutes. The items were concerned with (i) demographic details of the teacher and his or her pupils, (ii) attitudes and behaviour towards accent usage and change, and (iii) attitudes and behaviour relating to pupils' oral reading habits. This last sphere of inquiry is of little direct consequence to the problem in general, and thus will not be reported. The relevant questionnaire items are listed in the Appendix.

3. RESULTS

70 questionnaires were returned; however, due to inadequacies and/or insufficiencies in responding only 60 could eventually be used in the analysis. 42 of these were reported as deriving from mainly 'working-class' (WC) teaching situations, 5 from staff teaching 'middle-class' (MC) pupils and 13 from teachers who reported their teaching classes as equally socially mixed. For the purposes of quantifying the data, the 5 MC responses were incorporated with the socially mixed category of respondents.

There are at least three possibilities which may explain the dis-

proportionately high response from teachers instructing *reported* WC children in relation to 'middle-class' teachers:

- (i) that the schools located in predominantly middle-class areas did, in fact, incorporate a high proportion of working-class pupils;
- (ii) that teachers instructing MC pupils are not prone to providing their opinions as regards language, or perhaps more specifically, accent behaviour in the contexts of academic research;
- (iii) that teachers in general tend to perceive their pupils as more often than not derived from working-class homes. This notion is highly speculative, but if true, might stem from a teachers' tendency to stereotype pupils into one social class, or alternatively be based on the fact that teachers' criteria for categorising different social classes is operationally distinct from indexes adopted in the social sciences.

The distribution of teachers' and pupils' *reported* accents are provided in Table I.

TABLE I
FREQUENCY DISTRIBUTION OF TEACHERS' AND
PUPILS' ACCENTS AS REPORTED BY THE TEACHERS

	<i>Working-class sample (n = 42)</i>	<i>Socially mixed/MC (n = 18)</i>
Teachers' accents:		
R.P.	15	12
Local accent	12	3
Alien accent	15	3
Pupils' accents:		
R.P.	1	4
Local accent	40	9
$\frac{1}{2}$ R.P. + $\frac{1}{2}$ local	1	5

Although the sample numbers in Table I are unsatisfactory, there appear three important trends:

- (a) that WC pupils are more likely to be taught by an 'alien accented' teacher than children instructed in a socially mixed or MC school setting; an 'alien accent' being defined as one not characteristic of the specific locality, other than R.P. (e.g. in this situation, Welsh and Northern accents, etc.). The significance of this fact will be discussed later;

- (b) that pupils taught in a socially mixed school setting will be more likely to be taught by an R.P. teacher than working-class children in a working-class school setting (statistically significant at the 5% level by means of the Standard Error of Proportions Test);
- (c) that children taught in classes of predominantly WC children are less likely to have an R.P. accent themselves than pupils instructed in a socially mixed situation or in predominantly MC settings. Nevertheless, it is important to note that the teachers still only report less than one-quarter of their pupils possess an R.P. accent, even in the socially mixed and MC settings. However, it must be stressed that the above figures cannot be taken as purely factual since they merely reflect the teachers' perception of their pupils' and their own accents, which may, of course, be unwittingly biased.

As regards to the teachers' behaviour towards accent usage and change, the results may be discussed as follows. 12 socially mixed/MC, and 23 WC teachers reported that they *encouraged* the use of the standard accent, while only 5 and 3 teachers respectively, *emphasised* its use. However, 8 socially mixed/MC and 10 WC teachers considered it *important* to teach the standard code, but of these, 10 considered it important only in terms of the improvement of language communication content (e.g. universal intelligibility, clarity etc.), the remainder being aware of the social stigma of regional accented speech in many situations. In other words, out of the total sample of respondents, only 13.33% of the teachers afforded any indication of associating low prestige with non-standard usage. Those who did consider it important were divided amongst themselves as with whom the responsibility of developing this code lay; 8 teachers claimed it the parents' function, 8 the teachers' responsibility while two respondents considered it a task for equal and co-operative responsibility.

Opinion was also divided within the total sample concerning the probability of success in transforming a child's accent usage to include another code. 30 teachers (or half the sample) claimed it was possible by means of imitation, continual practice and correction, 4 were undecided while 26 considered it almost impossible within the limited confines of the school situation. From this last group, 20 teachers reported that the impracticability of such a project would almost

entirely be due to the overwhelming priority given by the child to the language situation of the home and the immediate environment, which would be most difficult to counteract adequately.

51 of the teachers reported that they saw their pupils' parents occasionally or more frequently, but only four teachers would claim they considered it relevant to encourage the use of a standard accent by the parents to their children in the home situation.

In response to the item pertaining to the extinction of regional accented speech, not unexpectedly, almost the entire sample was in opposition to this extreme notion, yet nevertheless, two MC teachers did advocate this action. The reasons offered for this disenchantment with the proposal were:

(a) 19 respondents mentioned the fact that they were utterly opposed to any introduction of homogeneity in accent habits. However, it is worthy of consideration that most individuals are continually exposed to the same environment and thus the same verbal milieu without any plea for liberation from the frustrating forces of accent satiation; individual variations in speech rate, pitch, vocal quality and intensity and also semantic content would appear to fulfil most requirements for richness in verbal heterogeneity. It may have been interesting to determine if teachers' defence of heterogeneity would have extended to encompass the maintenance of coloured immigrants' accent patterns also.

(b) 8 respondents claimed that the British regional accent was an important asset of our cultural heritage.

(c) Another 8 participants claimed that many accents were extremely attractive and pleasant. Although it cannot be denied that there are individual differences in aesthetic sensitivity, in the earlier study mentioned, Giles (loc. cit.) found evidence suggesting that regional accents are conceived of as more or less *neutrally* pleasant, and certainly more pleasant when thought about than when actually vocally presented.

19 respondents recorded the fact that they considered it more important, and indeed practically relevant to standardise grammatical rather than accent usage. In other words, teachers seem perfectly prepared to standardise many levels of regional *dialect* usage, yet arbitrarily halt at the phonological level—the orientation would seem to be a little dissonant with a comprehensive defence of local, regional variation of a language in terms of cultural heritage and against the introduction of homogeneity.

6 respondents, however, were afraid that providing children with another accent might *interfere* with their personality development, spontaneity and fluidity of speech. In this context, it would seem relevant to quote Lawton's (loc. cit.) viewpoint, that 'teachers may feel that it is not morally or socially right to interfere with a pupil's way of life in this fashion. These questions of conscience may be praiseworthy, but logically they are unsound for . . . any form of teaching is to some extent an "intrusion" or "interference".' Probably more far reaching in its implications is the related point made by 7 teachers that the conscious encouragement of a standard accent would stimulate home-school conflicts which may be harmful to the child. The effect of competence in a code which is of little value in the home setting, and possibly ridiculed by the parents because of its pseudo-connotations is likely not to be beneficial.

The important differences between the teachers of the two different socially composed groups of pupils may now be summarised in Table II.

TABLE II

SOME BEHAVIOURAL AND ATTITUDINAL DIFFERENCES OF TEACHERS INSTRUCTING WC PUPILS AS COMPARED TO SOCIALLY MIXED/MC SCHOOLROOM SETTINGS IN TERMS OF PERCENTAGES

	<i>Teachers of IVC pupils</i>	<i>Teachers of socially mixed/MC pupils</i>
Teachers' accents claimed 'standard'	35.71%	66.67%
Pupils' accents claimed 'standard'	2.38	22.22
Teachers 'encourage' standard	54.76	66.67
Teachers 'emphasise' standard	11.90	16.67
Teachers consider teaching standard important	23.81	44.44
'Frequent' contact with pupils' parents	28.57	50.00

4. DISCUSSION

The generality of these results are obviously limited because (i) the group samples are unsatisfactory in terms of absolute and relative size, and (ii) the teachers, if indeed representative of Bristol schools, may not reflect the attitudes and behaviour of teachers from other areas concerning accent usage and change. Nevertheless, the results demonstrate many interesting trends which, at the very least, warrant further investigation. However, several factors need consideration before these results can influence any genesis of an educational pro-

gramme for accent extension. These factors pertain to (i) teacher problems, (ii) pupil problems, and (iii) parent problems.

(i) *Teacher problems*

(a) *Teachers' accents.* As can be observed from Table I, the teacher in a socially mixed/MC school is more likely to provide a better speech model in terms of an accent extension programme than the teacher of predominantly working-class children. This latter teaching situation appears to provide more local accented speakers to reinforce the working-class pupil's own account, and also relatively more 'alien' accented teachers than the contrasting schoolroom setting. Thus it would be of little value introducing an accent extension programme generally into schools unless the teachers concerned were able to offer adequate models themselves.

The relative diversity of alien accented teachers in the working-class schoolroom may itself afford a unique problem. Wenner (1967) found using American subjects that the immediate recall of word lists is significantly better when stimulus words are presented in the standard dialect rather than a non-standard version, even though the listeners may themselves be non-standard speakers. Obviously, if this is also the case in Britain, the effect of introducing alien accented teachers in a classroom may have a profound effect on other areas of cognitive development, not only memory. It would seem that this problem deserves immediate research attention.

(b) *Teachers' attitudes.* If the accent extension programme was ultimately considered an educationally viable proposition, not only would many teachers' accents have to be reoriented, but also their attitudes regarding the social values of regional accented speech. The fact that only 13% of a particular teacher population was aware of the potentially detrimental effect the regional accent has for many speakers in many social situations is sufficient evidence for it to be necessary for new information to be provided to teachers concerning the social implications of accent usage.

It would also be necessary to persuade teachers that the educational aim would be, to use Lawton's words, an 'extension of experience rather than a conversion process', for the ideal aim of such a programme would be to provide the child with the verbal equipment to deal with different types of social situations efficiently and effectively. As Crosby (1966) has commented, 'the job of the . . . teacher is to help children develop an understanding of the appropriateness of the dialect to the situation. Family dialects are

appropriate to family discussions: informal standard English is necessary to obtain and hold a job and advance.' In other words, no attempt should be made to derogate the pupil's accent which should be developed, if possible, alongside the standard.

In Table II, the socially mixed/MC schoolteachers' attitudes again appear more consistent with any new approach in this direction. Although the trends are not statistically significant, the teachers of working-class pupils are *less* likely to encourage and emphasise the use of the standard, and also *less* likely to consider it an important facet of the child's education than the contrasting group of teachers.

(c) *Teachers' capabilities.* Watts and Caliguri (1966), in America, have brought attention to the fact that elementary schoolteachers are basically inadequate to cope with the teaching of dialect and accent reform, and the situation is not likely to be any more encouraging in Britain. However, these workers did demonstrate the value of a six-day programme for teachers' language skill improvement, which reflected significant changes in terms of their attitudes and understanding of linguistic skills. A similar vacation course would also have to be constructed extensively in this country in order to explain problems, skills and techniques to teachers who would be actively engaged in adopting an accent programme for use with their pupils. Furthermore, a more vigorous and detailed course would be necessary concomitantly within the confines of the curriculum at the teachers' training level.

(ii) *Pupil problems*

(a) *Self-motivation.* Many American linguists have envisaged the dialect extension programme in their country as a problem analogous to second-language learning, and therefore it would not be irrelevant to quote from this particular area of research. Gardner and Lambert (1959) have shown that second-language learning achievements are usually enhanced when the learner possesses a strong, 'integrative' motivational orientation towards the language and culture concerned. Similar findings have been reported by Jones (1950) relating to second-language learning in Wales. Lambert (1967) defined this 'integrative' motivational orientation as where 'a student is oriented to learn more about the other cultural community, as if he desired to become a potential member of the other group'. Thus, if the concept of an accent extension programme was actually realised in this country, it would seem that this same type of integrative motivation must be stimulated towards the language and 'culture' of the

standard code speaker by the teacher if successful results are at all to abound. Indeed, as Golden (1959) advises, 'speech improvement must be self-improvement. We cannot change the student's patterns for him, but we can bring about awareness of a need for change, aid him in finding ways to make the changes, and encourage his effort at self-improvement.'

An American educational programme published by the National Council for the Teachers of English (NCTE) and the New York Board of Education to develop a standard dialect for non-standard speakers (see Reference) incorporates the notion of self-motivation within its precincts. For by constant reference to and the utilisation of television, film and radio performances to promote the values of standard English, the programme claims that pupils will want to identify with speakers of this code. The extension programme itself has three basic linguistic goals:

- (i) to show that, despite the existence of many dialects in the United States and the strong differences among some of them, every individual who wishes to should have the right and the opportunity to acquire a variety of standard English for the broader access to community life and the surer chance of economic success that it will give them;
- (ii) to understand that there is an appropriate spoken language determined by circumstances suitable to the place, time and people involved;
- (iii) to acquire ease in the use of standard English by learning effective listening skills and appropriate articulation and pronunciation.

This programme appears a most excellent tool for an approach to dialect extension and would merit the close attention of educationists and linguists in this country for converting its content into more suitable material for British schoolchildren in the event of an interest in formulating an accent extension programme.

(b) *Pupil readiness.* Almost one-third of the total sample used in the present survey claimed that the teaching of standard grammar was more important than instruction in the standard accent; this therefore, raises the dilemma of educational priorities. Have, in fact, infant and primary schoolteachers enough on their hands already without schemes for accent extension? The answer is almost certainly in the affirmative. Perhaps it would be worth considering pre-school training (in the form of nursery school training) as a useful opportunity to exploit an accent extension programme. Many workers, such as Fellows (1962), have argued for the efficacy of pre-school training,

while Professor Hess in Chicago has been convinced of the usefulness of nursery school education for the development of many linguistic levels. Indeed, the Plowden Report of 1967 on primary school education recommended the expansion of nursery schools for priority areas. Now since no general scheme for the adoption of a nursery school network across the country has been fully considered as yet, the introduction of an accent extension programme might be conveniently interpolated into the eventual scheme before the critical period of language development has commenced in the child. However, before this convenience feature is so readily satisfied, caution should be undertaken to ensure that the pre-school child is capable of developing the sufficient self-motivation envisaged as so necessary for success in such a venture.

(iii) *Parent problems*

The NCTE somehow made no provision for this problem, that is, the home-school conflict—a dilemma dominant in the minds of so many respondents in this survey. If such an accent extension programme were to be introduced, it would need the full support and co-operation of all parents concerned to help facilitate its progress. This would entail carefully explaining to the parents why the programme was embarked upon and how it operated, and also discussing the problems with them. However, as Lawton has stated, 'to encourage contact between parents and schools is laudable but only as a starting point—it is also necessary for teachers to be able to understand the cultural background of the parents and to be able to communicate with them. It must be emphasised in dealing with the . . . child and his parents that his culture in general, or his form of speech in particular is in any way inferior to the culture of the school. The concept of appropriateness rather than right or wrong speech should become the desired end.' Perhaps the most desirable conditions under which an enthusiasm may be engendered by the parents towards a language programme are parent-teacher contacts in the home environment. Tamara Salaman, in a recent edition of *New Society*, writes that 'often parents are nervous when they come to school. They can feel that they are like visitors who have to be careful what they say. But when I see them in their homes, they are in charge; they feel important and secure. They get the message that I have time to talk. When they visit us at school there may be a queue to talk to a teacher; they feel they must be specific in their questions. . . . It must be true that the diversity and complexity of a

family is hard to fathom in the school environment; in the home I get more of a chance to adapt my approach to the people.'

Lawton also talks in terms of bridging the gap between school and home such that 'what seems to be required is that the school must work out areas of action for parents that they *can* perform and which lead to immediate success'. This notion of active involvement by the parents in the child's linguistic development has been shown to be most effective and desirable by Karnes et al. (1968). In this connexion, mothers (of disadvantaged children in this instance) made instructional materials and learned methods for using such materials with their children at home. Children of mothers in this training programme at the end of eleven weekly two-hour sessions manifested significantly higher gains than control children on measured intelligence and psycholinguistic skills. The desirability of obtaining mothers' co-operation in a similar fashion were an accent extension programme adopted, and stimulating their interest in their children's language extension, cannot be underestimated. Indeed, such involvement may facilitate other linguistic and cognitive skills in their offspring's development. However, reference to Table II indicates that the amount of teacher-parent contact is relatively lower for the working-class teacher, therefore providing a greater burden on such teachers to organise stronger and more useful links between school and home. A possible reason for this relatively lower attendance may be the wide language gulf between school and the home, as Salaman reports of one parent, 'I don't like to speak [at school meetings] because of the la-di-da accents. If you're only working-class it's hard to join in.'

In essence then, the adoption of an accent extension programme in schools would lead in time to assume a situation similar to that referred to by Ferguson (1958) in many distant cultures as 'diglossia', which implies separation into role sets in each of which different verbal modes prevail. Under such conditions as these, the standard dialect is spoken in all socially mixed, formal or public situations, while the argot of the region is maintained only within the relative privacy of the individual's immediate primary social groupings. On the other hand, we may be experiencing a slow, 'evolutionary-type' process towards the one standard accented code through increased educational opportunities, mass media and travel anyway.

5. SUMMARY

Although the sample size was unsatisfactory, it has been shown

that teachers of working-class children are less adequate speech models in terms of the introduction of an accent extension programme than teachers of socially mixed or middle-class school settings. Also, the attitudes and behaviour of the latter are relatively more consonant with the desired aims of such a programme; however, only 13% of the sample gave any indication of an awareness of the social stigma of regional accented speech. It was emphasised that a programme of this type would facilitate accent *extension* not *conversion*; a useful American dialect extension programme was mentioned in terms of its potential transformation towards British usage. The problem of teachers' capabilities, pupils' self-motivation and readiness, and parent participation were also discussed in relation to the scheme.

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APPENDIX

Questionnaire

It is stressed that your answers will be treated confidentially, and will only be incorporated in numerical data representative of specific groups, thus your name and that of the school are not required.

1. Have you had 3 or more years teaching experience post-training?
2. With which age group are you primarily concerned? yrs.
3. How would you assess your pupils in terms of the proportion of the social classes?—majority middle class/ majority working class/approx. $\frac{1}{2}$ each.
4. How would you assess the accents of your pupils?—majority with Bristolian or a S.W. England accent/majority with a standard English accent/approx. $\frac{1}{2}$ each.
5. With what accent do you yourself speak?
7. Do you consider it a functional part of your teaching to *encourage* the use of the standard English accent by your pupils? perhaps
even *emphasise* its use?
8. Do you consider it more a parent's duty than your own to encourage a child's use of a standard English accent? If yes, why?
9. Do you consider it important to teach a pupil to speak with a standard English accent? Why?
11. Would you advocate an attempt to make the regional accent extinct as soon as possible? Why?
14. Do you think it at all possible to change a pupil's Bristolian accent towards a standard English version? If yes, how? If no, why not?

18. Do you see your pupils' parents—frequently/occasionally/rarely/never?
20. Do you invite parents to encourage the use of a standard English accent at home?

THANK YOU

Any further comments you would like to make? .

WORSHIP AND EDUCATION

(*The Fourth R: The Report of the Commission on Religious Education in Schools. National Society and SPCK, 1970*)

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I. INTRODUCTION

THE *Durham Report on Religious Education*, which appeared in June of 1970, offers an authoritative survey of the role of religion in education in England and Wales. Chapters on theology and education, on moral education and on religion in the educational systems of other Western societies offer much stimulus to thought, and the recommendations arising from the survey will be welcomed in most cases by moderate opinion. The suggestions that the statutory position of the Agreed Syllabuses should be abandoned and that the wording of any new Education Act should be much more flexible regarding the place of religious education, are examples of the readiness for change which the *Report* exhibits at many points.

There is however one important area in which the *Report* is not entirely satisfying. School worship, far from being incompatible with educational principles, is thought to be required by them, and should therefore be retained in the county school (see 'Worship and the Curriculum' *Journal of Curriculum Studies* I, No. 3, 1969, pp. 208-218). A number of arguments are offered, but the one derived from consideration of educational ideals is 'the one most cogent reason why school worship must remain in English schools' (par. 297). It is this argument which will be discussed here.

2. THE EDUCATIONAL ARGUMENT FOR WORSHIP

Two related arguments may be discerned in that part of the *Report* which deals with worship in county schools (pars. 284-320) and elsewhere in the volume. The first one which will be discussed here is derived from consideration of the content of religious education and the second from consideration of the aims of religious education.

(a) *The argument from the content of religious education*

This may be summarised as follows: 1. Religion is educationally justifiable as part of the curriculum (pars. 112-116 and 201-218). 2. Worship is a 'significant feature' (par. 297) of religion. 3. 'Some experience of worship is essential . . . if justice is to be done to the content of religious education' (par. 117).

The first proposition needs qualification and is indeed qualified both directly and by implication at various points in the *Report*. The truth of the matter seems to be that *some* aspects of *some* religions are justifiable as part of the curriculum. The doctrine of original sin, in some of its forms, is not a suitable basis for the upbringing of children but the concept of Christian love is highly significant for the whole of the educational process (par. 138). Certain parts of the Old Testament could inhibit moral development (par. 185). A religion with an exploratory approach towards its own theology is more consistent with modern Western educational requirements than a religion which might have a closed and static theology (par. 113). The teacher must select from the numerous sacred books (par. 213) and must go on selecting from the immense quantity of religious facts and beliefs those which he finds are most appropriate to his pupils and most consistent with the ethos of the educational environment within which he works. He asks if the proposed material is pupil-related, if it is relevant, and if it can be taught in an open-ended way (pars. 246-248). We conclude that there are aspects of a particular religion or of religion as a general human phenomenon which however significant they may be in their religious context might not necessarily be studied in the county school or in any school, perhaps because the material is inappropriate for the level of understanding of the pupils or because it is unhappy in its association with the ideals of the rest of the curriculum.

Worship is certainly a significant feature of the Christian religion and of most other religions but this in itself does not allow us to include the study or the practice of worship in the curriculum. If however there were no other over-riding objections to its inclusion, the argument that an item was necessary to do justice to the full content of a subject would be a strong one. Private prayer is a significant feature of Christianity, and so is the mission of the church in evangelism, but teachers in county schools do not set so many minutes of private prayer as homework, nor a certain amount of missioning experience as a vacation task. On the other hand, service

to others, which is also an essential aspect of Christianity, is encouraged by many religious education teachers (and others) and often officially supported by schools. Some important features of the Christian faith, such as participation in the Eucharist, are not insisted on in county schools partly for ecclesiastical reasons, and others such as private prayer and mission experience are not insisted on for mainly educational reasons. These examples illustrate the point that although certain important aspects of certain religions ought to be included we cannot claim that any particular aspect must be studied or performed at school merely in order to do justice to the subject. We may only claim this if there are no over-riding considerations. Such considerations do exist, I think, in the case of performing worship, but not in the case of studying worship.

(b) *The argument from the aim of religious education*

This argument, which appears at several points in the *Report*, may be summarised as follows. 1. The aims of religious education can be justified educationally (par. 215). 2. Experience of worship is a necessary stage in the fulfilment of these aims: (a) *The linguistic argument*: to understand a religious proposition it is necessary to see it in its real-life setting. This will include the ritualistic and worshipful contexts of religious statements (par. 117); (b) *The experiential argument*: worship is the practical application, the experienced reality, of religion corresponding to the practical aspects of other subjects (latter part of par. 117 on p. 61). Thus 'religious understanding' (one of the acceptable aims of religious education) 'cannot be developed without experience of worship' (par. 298 on p. 136). 3. Acceptance of the aims of religious education entails acceptance of regular school worship (The argument is summarised in this form to highlight the aspects which concern us here. The *Report* does not omit discussion of why the worship may not satisfactorily be provided at home or church).

The linguistic argument, as it is here being called, is in itself a valuable comment on teaching religion. It is undoubtedly true that religious statements cannot be correctly understood if they are removed from the contexts in which religious communities use them. The devotional and liturgical setting is certainly important, and this should be studied. But there seems to be insufficient reason for thinking that this understanding can only come, or may best come, through the pupil's actual participation as a worshipper in regular services of worship.

Religious educators want their pupils to exercise empathy towards religious people and critical sympathy towards what they say. They rightly want them to understand, as far as the limits of the county school situation permit, what it feels like to be religious. Since it is not the object of teachers of religion to secure or 'even to press for acceptance of a particular faith or belief system' (par. 217) it is not possible to have pupils understand what it is like to be a Christian and to use Christian language by actually converting them. It must therefore be done by good teaching, by representation, by imagination, and by the growth of insight. It may be done by meeting, listening to and talking with religious believers, by collecting their prayers, and by visiting and observing (whether on or off the school premises) religious worship and seeking to comprehend the atmosphere and the intentions of such services. But the need to study the worshipful context of religious language does not seem to require actual worship, even if the number of services is reduced from five to two or three a week (par. 309). There are, in short, various ways in which one can 'look to the worshipping activities' (par. 117. Quoted by the *Report* from Ninian Smart) of religions and actually worshipping is in some ways the least desirable.

The experiential argument, as it is here being called, is not satisfactory for the following reasons.

1. The practical, immediately experienced aspects of religious studies in schools are rather varied but include catching the inspiration of great lives, following a religious discussion between teacher and class, seeing how a teacher deals with a religious problem, painting or acting religious scenes or portraying religious emotions, and watching and as uncommitted guests courteously taking part in the ceremonies of various religious communities. There is a further sense in which all experience of service, of love, of alienation and of reconciliation may, as this *Report* shows so clearly, help the pupil to existentially understand certain religious expressions and symbols. It is misleading to narrow this wide range of ways in which pupils may be helped to experience the power of religion to their actual participation in worship. The error rests upon the supposition that in the class room one is only talking about religion whereas in worship one is actually approaching God. We ought rather to say that experiencing worship is but one of the ways in which pupils may come to understand what it would be like if they believed in God. Then we should ask whether some of the ways are educationally preferable to other ways.

2. But although this variety exists in the means whereby teachers of religion may help their pupils to see the life-setting of religious language, and by imagination to enter into it themselves, there are also limits to the variety. We have already seen, and the *Durham Report* rightly emphasises, that teachers of religion may not seek to actually convert their pupils, although this would obviously be the most effective of all ways of helping them to grasp the existential meaning of religion, nor may they expose them exclusively to one religion in the hope that they will come to understand and value that one religion, nor may they take advantage of their superior knowledge, experience and perhaps intelligence to force religious views on their classes. The situation teachers of religion face is that some of the means of introducing pupils to religion are legitimate and others are not. Expecting, indeed requiring pupils to worship seems to be in the latter category.

We have seen that the arguments which the *Report* advances to show that school worship is *required* by educational and religious educational considerations cannot be sustained. Not only do the arguments not compel the conclusion, but other difficulties arise which seem to count rather strongly *against* the conclusion. We will now consider only the main difficulties which the *Report* itself envisages.

3. PROBLEMS ARISING FROM THE ARGUMENTS ABOUT EDUCATION AND WORSHIP

A. The *Report* discusses the problems which arise from the tension *between worship understood theologically and worship understood educationally.*

(a) *Worship understood theologically.* The central purpose of Christian worship is 'to respond appropriately to the love and grace of God as seen in Jesus Christ, and to make the divine power a reality in the lives of the worshippers' (par. 295). In discussing the educational use to which worship may be put, the *Report* reminds us forcefully, 'It can only be worship if it is indeed the appropriate response of creature to creator and, as such, an activity to be undertaken for its own sake' (par. 298). The problem which immediately arises is faced in what follows, 'To regard it in this way is admittedly, as the secularist maintains, to assume the truth of certain Christian doctrines' (par. 298). (It should be said this is not only maintained by the secularist but by certain Christians such as the present writer.)

(b) *The educational norms for religious teaching in county schools.* Religious education must be heuristic: '... the exploratory aspects of a discipline whose task of interpretation is never complete nor rounded off in a neat system' (par. 113): '... religious education is conducted in the form of an exploration, that no one view-point is considered automatically or regarded as invariably correct' (par. 248).

There is clearly some tension, of which the *Report* is well aware, between worship, which since it assumes the truth of certain doctrines appears to be a closed intellectual activity, and the rest of religious education, where no doctrine or truth is considered to be invariably correct.

The problem is dealt with in the *Report* in two ways. The first involves a consideration of the psychology of the worshipper. The theological point of view does not exhaust the description of worship. If held too exclusively a theological description may be 'too restrictive' (par. 296) and 'Worship cannot solely be defined' in this way. Worship has 'diverse origins' and produces a 'diversity of human reactions' (par. 296). When we contemplate the psychological responses to any given act of worship or examine the composition of almost any worshipping group, it can be seen that 'Attendance at an act of worship does not necessarily imply or pre-suppose total personal commitment to the object of worship' (par. 296) (This is probably the 'easement of conscience' which is referred to in par. 317).

This point is supported by an analysis of worship into the expressive and the didactic. 'Needs and fears' may be expressed in worship as well as adoration (par. 299) and worship shares with classroom activity a certain teaching function (par. 300).

It is difficult to see that these replies are successful in meeting the force of the problem. Although not exhaustive, the theological description of worship is, as the *Report* rightly emphasises (par. 298), essential for Christians and consideration of the variety of moods and reactions of those present at an act of worship in no way weakens the demand of the theological nature of the act. To what extent then does the observation that people vary in their reactions to worship offer relief to the conscience of the uncommitted person? For although it is valuable to respond with 'humility and awe' or with 'world-weariness and fear' (par. 296) is it also valuable to respond with scepticism, with unqualified disbelief, and with rejection of the

assumptions of the act of worship? Attendance may not imply total commitment, but does it imply any commitment at all? It might be said that all it need imply is commitment to a search for religious truth. But worship assumes certain doctrines to be true. There is considerable difference between a search for truth and an assumption of truth. (It is interesting to see that in par. 357 the practice of confirmation in independent schools is described as having 'been all too often . . . a ceremony undergone by almost all pupils whatever degree of Christian commitment they have reached'. The same is true of county school worship.)

Moreover, members of staff and pupils are usually not only expected or required (as the case may be) to attend. They are expected or required to take part. They hold hymn books in their hands. They bow their heads. They stand and sit together at the same times. They sing and speak words addressed to God and to Jesus Christ. Is school worship ever conceived of as presented by the religious education department to mere spectators? The act of worship in schools normally assumes participation. And those who participate in the worship participate in fact or by strong implication in the assumptions upon which the worship is based and which it exists to express.

The division of worship into the expressive and the didactic is inadequate since the most significant constituent is omitted, namely, the affirmative. The nature of the didactic process in the worship is fundamentally different from that which takes place in the classroom.

The problem of the openness of worship is discussed in par. 298. Openness, the *Report* indicates, does not mean that the teaching of religion will proceed without any basic assumptions (pars. 136f) and adherence to these basic assumptions is held to be consistent with the required openness. But openness as defined in para. 248 is clearly not reconcilable with the position of worship as described in para. 298. In class room teaching one certainly starts from basic assumptions. But no basic assumption is free from examination and criticism at some time or other in the teaching periods. In worship however one not only starts but finishes by assuming the truth of certain doctrines.

B. A second problem discussed in the *Report* is the difficulty of finding an alternative to the present situation. The *Report* is not however very consistent at this point. The secular type of assembly is allowed to take place occasionally (para. 312) although it is described

in rather an unimaginative way. But in para. 306 the secular assembly is regarded with some caution, because, it is claimed, 'that would have very clear irreligious implications'. A secular ceremony is envisaged as 'studiously excluding all "religious" material'. But this fear is surely groundless. The *Report* itself asks that where secular assemblies are held that they should 'at least sometimes recognise that religious values are a feature of . . . humanity'. This is a moderate and reasonable request. There should be little difficulty in arranging school assemblies which recognise the religious in various ways not only sometimes but often.

The *Report* concludes that direction of school worship should continue to be a statutory provision. This is considered necessary in order to avoid changes of policy with changes of personnel and to avoid local controversy if responsibility for worship were to become local (para. 310). But in the complex situation of the multi-racial school, it is suggested (para. 315) that the pattern of school worship could be agreed by the local authorities, including the teachers of the school concerned. Why should not this become the usual pattern? Why should there not be occasional changes in local policy? The *Report* wisely recommends that the statutory position of the Agreed Syllabuses should be abolished (par. 219). 'We seek for religious education the same freedom which is enjoyed by every other subject' (par. 220). Why should not the admirable situation described in par. 220 where the content of classroom religious education is the product of local experiment and consultation also prevail in decisions about the nature and in the selection of the content of the school assembly?

4. CONCLUSION

There are, as has already been noted, other arguments in the *Durham Report* for the retention of school worship. But this, the 'one most cogent reason', the argument about the necessary association of school worship with religious education as it is currently being understood, fails to convince.

TOWARDS A TEST OF LANGUAGE PRODUCTION

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I. PROBLEMS OF MEASURING PRODUCTION

IN a previous article reporting progress in a project concerned with the investigation of language deficiency in educationally subnormal (E.S.N.) children discussion centred round the relationships obtaining between short term memory for unstructured strings of digits or words and performance on two language tasks. One task involved the repetition or imitation of sentences of varying grammatical structure. The other task required selection of the correct picture from a set of four pictures in response to the presentation of a sentence. The grammatical structures used in the sentence were the same in both tasks.

It was found that in both tasks poor performance was significantly related to restricted short term memory as measured by words strings and digit strings. In the case of sentence repetition this is hardly surprising. Miller (1962) hypothesized that grammatical structure in a string of words permitted some kind of grouping or chunking to take place. Memory spans with a very limited capacity of, say, two words or digits can cope with some sentences of eight words (Graham, 1968). What was more interesting was that 'chunking' could occur with some sentence types but not with others. There were various degrees of success with different sentence types, even when sentence length was constant and the level of vocabulary used was carefully controlled.

When the subjects were not required to imitate sentences but merely to identify the correct picture in a specially devised array of four (see Graham and Gulliford, 1968) it was again found that independently of the effects of intelligence performance was related to restricted memory span.

The results obtained with these materials are set out in Graham (1970a, 1970b). They are to be seen in relation to a view of language

which regards speech as a high order skill depending on some kind of implicit knowledge of the structure of language but also on other things besides. In particular the studies cited have brought out the importance of restricted short term storage which acts as a psychological constraint on the deployment of linguistic knowledge in actual performance.

The imitation and the comprehension of sentences sample important aspects of language performance. Using the materials devised varying degrees of proficiency in processing sentences can be detected. The procedures show evidence of being valid and reliable measures of aspects of language proficiency but clearly they do not cover the whole of language performance. Any battery of tests purporting to measure language proficiency must also include amongst other things tests of the ability to use language productively.

In the past, investigations of productive capacity have most frequently been performed in terms of the language output of a few subjects in response to standard stimuli in the form of modelled situations, pictures or cine film. Several recent investigators have also collected spontaneous utterances in the normal surroundings of the subjects, e.g. Brown and Fraser (1963); Weir (1962). Such samples of language output are relatively easy to collect and transcribe with modern electronic recording equipment but the practical and theoretical problems of how to segment, analyse, and quantify the significant properties of such samples has been a continuing barrier to the objective of the investigators which has usually been to discern patterns of age related change in speech.

This is not to say that such studies have failed to add to our understanding of the kind of language which children actually do use but the results depend on methods of analysis and quantification which vary according to the *a priori* notions of the investigator as to the nature of language and its significant dimensions and properties. The difficulties involved in avoiding arbitrariness are always very great and the generalizability of the findings is limited. It is often difficult also to replicate the results.

Such methods of studying language production in children suffer from other short-comings, especially if, as is generally the case, the results are used to make inferences about productive capacity or the children's total and underlying mastery of the forms and structures of their native language i.e. their linguistic competence. Besides sampling language proficiency, which no doubt they do to some

extent, they freely sample also personality and dispositional variables since it is not always clear to the child what it is the investigator is asking of him. In any case in a 'free' situation some children are habitually loquacious, resort readily to language and their output is correspondingly large in size and perhaps in diversity. Others however are laconic, unforthcoming and often fail to deploy their language capacities to anything like their full extent in this situation. The investigator has no way of distinguishing between reluctance and inability.

A third and perhaps more important difficulty is that the investigator has to take what he gets. The controlling stimuli for responses are not always obvious nor can he usually manipulate them with any degree of precision. In particular the method is too general and diffuse if interest is focussed on the availability of given types of utterance. Even with lengthy time-sampling it is unlikely that a child's available performance will exhaust his competence and the chances of this sample being representative of his competence is not necessarily very high. For a particular structure the investigator may have to collect thousands of utterances in order to obtain a single occurrence. He may stop collecting just short of its spontaneous appearance. He may then mistakenly conclude that this particular linguistic structure is just not represented in the subject's competence. Apart from anything else it is usually not possible to collect a subject's entire output over a sufficiently lengthy period of time to be certain that a subject has ranged over his entire repertoire of linguistic knowledge.

The alternative is to place the subject in a situation which will maximize the chances of his producing a particular structure in an utterance if it is within his competence to do so. The principle is one of maximum cueing short of mere repetition. Watts (1944) was aware of this dilemma and produced pictures of increasing conceptual complexity which were designed to elicit utterances manifesting certain grammatical structures. Unfortunately the principle of maximum cueing was not followed, with the result that the subject is still left with a high degree of uncertainty as to what it is he is expected to do. Watts moved sufficiently far to know that an example would be helpful but the fact is that the instruction contained in a single model is not sufficiently explicit.

In order to surmount these difficulties it was decided to follow Watts in preparing pictures to elicit sentence types but to provide

maximum motivation and cueing by having brightly coloured drawings and by providing not one model but several thus producing a learning 'set' towards the production of a particular structure. This procedure appears to be necessary in order to put a young child or a very dull child in the position of a linguistically sophisticated adult subject who can be presented with the verbal instruction, for instance, 'Give me a sentence with an adjective in it.' or 'Give me a passive sentence'. Such instructions, of course, mean nothing to naive subjects and unless alternative procedures can convey the same information to this subject about what is expected of him, nothing can be inferred about his competence from his performance or lack of it.

It would be possible to induce a 'set' towards the production of a particular structure by presenting the child with several 'models' or examples and then testing him on a final item. It was felt that a better and more economical procedure would be to use each picture in a series aimed at eliciting a particular structure first as a test and then, failing correct response, as a practice item when an appropriate utterance manifesting the target structure would be presented as a model.

2. THE MATERIALS

Twelve 'target' structures were used corresponding to the twelve transformational types used in the Repetition and Comprehension sub-tests. A basis for comparability between the three tests was thus provided. The transformations used and examples of sentences are presented in Appendix A. For each transformation six model sentences were written. Sentence length was not felt to be important here but in fact most sentences contained eight words. The sentences were characterised by the use of the simplest possible level of vocabulary (Dale, 1931) and depicted everyday situations of home, school, street and park. There may be an element of social class bias but this was felt to be negligible and in any case testable.

For each sentence a simple line drawing was prepared reflecting as uniquely and clearly as possible its content. The pictures were then coloured in bright poster paints or ink. A single item, therefore, contained six sentences, all manifesting a particular grammatical transformation and six corresponding pictures. There were twelve such items plus additional practice items. A photographic facsimile in monochrome of one of the items is given in Appendix B.

3. INSTRUCTIONS TO SUBJECTS AND PROCEDURE

Subjects were introduced to the task after experience on previous occasions with the repetition and comprehension of similar sentences. Practice with and explanation of the training items ensured that subjects had a grasp of the procedures and no subject was allowed to continue until this was established. The instructions were as follows:

Tester: 'Look, here is a picture. Let's look at it carefully.' (Tester was then prepared to answer any queries about the names of objects depicted and provide necessary vocabulary.)

Tester: 'I know a message that goes with the picture. I wonder if you can guess what it is.'

Child: (*Produces some kind of utterance*)

Tester: Yes, that's right (if the utterance contains the 'target' structure)

or Yes, that's nearly right, but my message was: (Tester then gives the appropriate model sentence). Now you tell me that message.

Child: Repeats the model.

Tester: (Places that picture on one side still in view of the child and produces the next picture in the same series)

Here is another picture. It has the same sort of message. Can you tell me what the message is?

The procedure continued to the end of the item with the tester noting which pictures elicited an utterance manifesting the target structure. At the end of an item much play was made of replacing the pictures in an envelope or packet before the next item was produced in order to break the 'set' established.

It was sometimes necessary to provide additional cues by pointing out salient features of the picture or by giving the first word of the desired utterance. In some sentence types e.g. *Question* and *Relative Question* where the initial word placement is part of the structure being investigated, a set preamble or verbal context was provided. For instance, one item required the use of a relative question beginning 'Who . . . ' or 'What . . . '. When the required utterance was something like 'Who has lost this cap' (picture of teacher holding up boy's cap in front of class) the preamble was: 'Someone has lost a cap. Teacher has found it. She asks'. Clearly such cues will have to be taken to a higher degree of standardization as the test is refined and developed.

4. ADMINISTRATION AND SCORING

In preliminary trials items were presented in a different random order for each child since the relative difficulty of each item could not be established a priori. Also, within each item, the series of pictures was presented in a different random order, for the same reason. Subsequent item analysis established an order of difficulty between items and between pictures within items.

The procedure provided two kinds of score. In the first place each item was scored for the number of utterances out of six produced which manifested the target structure. This could be taken as a measure of the availability of the structure to the child. If a child produces a 'correct' utterance for each of the pictures then clearly the structure is represented in his competence. If he produces only one acceptable utterance after five models that structure is clearly within his competence but is not readily available. If he does not produce a single acceptable utterance (i.e. relative to the 'target' structure) this does not necessarily mean that it is not available to him in any absolute sense. It simply means that it has a low level of availability in this kind of situation). By adding up item scores an overall availability index will be arrived at and thus children will be differentiated according to the readiness with which they can produce utterances manifesting a particular range of structures. Since many of these structures are commonly occurring ones his performance with them may be taken as representative of his language proficiency. Language proficiency here must mean the readiness with which the child resorts to a variety of linguistic strategies in expressing himself.

The procedure provides a second kind of score related to the first. The score for each item is obtained by asking the question, did the child show evidence, however minimal, of productive control of this particular structure? Success with a single picture out of six provides such evidence. The score would then be one point for that item whether one or six acceptable utterances were produced. It was observed that such a scoring system produced very high scores indeed for most children.

5. DISCUSSION

This is clearly quite a complex task for the young pre-school child. The older language deficient child also finds this difficult though normal children of the same chronological age find very little difficulty

at all. The subject must interpret the pictorial stimulus and express what he sees in an utterance. If his first utterance does not contain the required structure (since the picture does not *uniquely* constrain the response) he must abstract from the model utterance which is then presented, the type of structure which is required and use this in expressing his interpretation of the next picture and so on.

The procedure is, of course, clumsy and lengthy and in initial trials with twelve items sometimes had to be given in two separate sessions. But there appears to be no other way of presenting such instructions as 'Give me a sentence in the passive mood'. It has to be admitted that there are, with this method of probing available language structure, still uncontrolled differences between children in the readiness with which they grasp the idea of what is required—the 'rules of the game'. The procedure, however lengthy, probably produces evidence of availability of structures which would not necessarily be detected by free response methods. This is tantamount to saying that the procedure is a better guide to a child's mastery of the forms and structures of his native language than measures of free response, or speech sampling in natural situations. The latter sort of information is of great interest insofar as it describes the level and nature of the child's habitual *use* of language, but frequently such information is used as a basis for inferences about what structures are represented in the child's underlying knowledge of his language.

Preliminary results with E.S.N. (ascertained and borderline) and normal Nursery school children, suggest that the children tested in the initial trials know very much more about their native language than superficial observation would give them credit for. It may be objected that in fact the test items actually *teach* the child the structure or that the child produces sentences by 'analogy' with the models. These are not alternative explanations. They merely restate the problem. How can some structures be *taught* in six examples while others cannot? Why is analogy possible in the case of some sentence types and not others. In view of the universal observation that it is not easy to get children to use new language structures, it does not seem plausible to suggest that this test does it in the case of some quite unusual structures with six examples. The contention of the author is that the children *are* learning something from the examples but what they are learning about is the intention of the tester. They are learning what precisely it is that is required of them in this situation.

The sentence repetition, comprehension and production materials are currently being developed as a means of investigating patterns of language deficiency in educationally subnormal children of primary school age. They are also being used as tests of developmental language proficiency with younger children as well as with other groups whose language development may be restricted to a pre-school level. A third area of application is with groups of Asian and West Indian immigrant children.

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APPENDIX A

Transformations used for items in the test together with examples of model utterances manifesting them.

1. QUESTION:

Example: Have you caught any fish today?

2. NEGATIVE:

Example: The house has not got any windows.

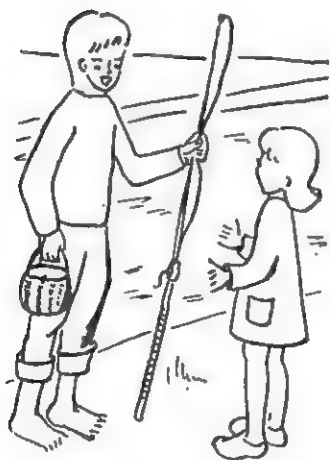
3. IF:
Example: You will get burned if you touch the fire.
4. NOMINALIZATION '—ING'
Example: The breaking of the window made her cry.
5. CONJUNCTION 'AND SO'
Example: The boy is hopping and so is the girl.
6. COMPLEMENT: '—ING'
Example: The girl saw the boy flying his kite.
7. AUXILIARY VERB: 'HAVE'
Example: The man has left his hat on the seat.
8. ADJECTIVE:
Example: The boy is carrying the round box.
9. PASSIVE:
Example: The pram is being pushed by the girl.
10. RELATIVE QUESTION:
Example: What have you got in the box?
11. RELATIVE CLAUSE:
Example: The girl who is crying has the doll.
12. COMPLEMENT: TO—
Example: He tells the dog to fetch the ball.

APPENDIX B

An example from the test of production.

Item 1. Type of utterance to be elicited—QUESTION

A



Prompt: This boy has been fishing.
The girl is asking him something.

Target
utterance: Have you caught any fish?

8



Prompt: This mummy has just got the cake out of the cupboard.
She is asking the boy something.

Target
utterance: Do you want a piece of cake?

For each structure to be elicited there was a series of six such pictures with appropriate prompts. The target utterances given are simply examples of the kind of response which is acceptable. Other responses constrained by the pictures are also acceptable as long as they are in sentence form and manifest the appropriate target structure.

APPENDIX C

RESPONSES TO THE PRODUCTION TEST

Two examples taken verbatim from tape recorded protocols are given. Two of the three subject groups, one ESN and one Primary are represented. Within each group the protocol of one child for a single item was selected at random.

Introductory and prompting utterances of the Experimenter are given in the left column and subject responses are given in the right column. The procedure for a single picture was concluded either when S produced the correct response or when E decided to supply the correct response. These events are marked in the protocols by underlining. The judgement of E as to whether the correct response had been attained or not is marked in a box alongside the last utterance: Attained [A]; Not attained [NA]. Total score for the item is given below that.

Darren—

Age: 6 yrs 5 mths

MA: 3 yrs 6 mths

STM: 3.2

School: Collingwood ESN Special School

*The COMPLEMENT—ING construction (Item ?)**EXPERIMENTER**SUBJECT*

1. Look at this picture, Darren.
 Will you tell me that message about a dog
 Yes. What are they?
 What can the dog see the mice doing?
 No ... what's this here?
 Is it food? ... Do you think that's the dog's bowl? might be mightn't it?
 Will you tell me that story then
 The dog ...
 ... saw ...
 h'mm ... go on ... The dog ...
 ... saw ...
 What are they?
 The dog saw ...
 And what are they doing?
 ... eating ...
 ... his food ...
 Good. *The dog saw the mice eating his food*
2. Now what did that girl see the boy doing?
 The girl ...
 The girl ... h'mm
 That's right. Good boy!
3. Now, see if you can make that one up by yourself
 The boy ...
 ... saw ...
 And what is it doing?
 Now start again ...
4. Now look at this one and tell me a message like the others
 The boy ...
 Good boy!
5. Now this one
 The lady ...

... Dog ...

Mice

They're fighting one another

...

...

Yes (laughter)

... The dog

... saw ...

... the dog ...

...

... mice

... the mice

...

... Eating ...

eating his food ...

[NA]

...

The girl

The girl ... saw ... the boy ... flying the kite

[A]

The boy ...

The boy saw ... a fish ... in there ... in the bowl swimming

The boy saw the fish swimming in the bowl [A]*The boy ... saw ... an aeroplane flying up the air*

[A]

The lady saw the little boy up the tree

That's right. But you didn't
tell me what he was doing up
the tree

*The lady saw the little boy climbing
up the tree*

Good boy!

[A]

6. Now this one

The cat . . .

The cat saw him pulling the curtains

[A]

Good

Score 5/6

Trevor—

Age: 7 yrs 6 mths

MA: 7 yrs 8 mths

STM: 3.6

School: Tiverton Road County Primary School

The NOMINALIZATION construction

Two practice examples were shown with appropriate utterances viz:

The barking of the dog made him afraid

The sinking of the ship made them jump (into the water)

EXPERIMENTER

SUBJECT

1. Now, can you tell me a story
about this picture. The . . .

. . . breaking . . . of . . .

. . . made her cry . . .

*The breaking of the window made
her cry*

The . . .

. . . the window . . .

. . . made her cry

[NA]

2. Now, look at this one. That girl
has been writing a letter . . .

What made her tired?

Can you make up a story like
the other one (refer to previous
pictures in the series)

What made her tired? The . . .

'Cos she's tired

. . .

The writing . . .

What she's sending to somebody

The boy and things . . .

. . . The writing . . .

[NA]

The writing . . . of . . .

. . . the letter . . . made her tired

That's nearly right

*The writing of the letter made
her tired*

3. Now look at this one

What has somebody done?

Yes. So what has made her
cross?

The . . .

Spilt the paint

. . . paint spilt

The spilling . . .	. . . of the paint
. . . made her cross	. . . made her cross
<i>The spilling of the paint made</i>	[NA]
<i>her cross. Good</i>	

4. Look at this picture	
What made those children	
dance?	Playing drums
The . . .	. . . drums . . .
The <i>something</i> of the drums . . .	
The . . .	. . . banging
The banging . . .	. . . of the drums
. . . made . . .	. . . them dance
<i>The banging of the drums made</i>	
<i>them dance—Good</i>	[NA]

5. Now this one. Tell me a message	
like the others about this one	
What has made those children	
so sleepy?	. . .
The . . .	. . . building
The building . . .	<i>The building of the house made them</i>
	<i>tired</i>
Very good	[A]

6. Look at this picture	
What made them happy?	The candles
And what is somebody doing to	
the candles?	Lighting the candles
What made them happy then?	
The . . .	The light of the candles
The lighting . . .	of the candles
<i>The lighting of the candles made</i>	
<i>them happy</i>	[NA]

Score 1/6

DIALECT IN SCHOOL

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Terms of reference: Most of the observation, reading and discussion that has preceded this paper has been in the context of the particular educational needs of West Indian children in British schools. The home language of many West Indian children is an English based Creole. It is a question of debate whether Creole languages should be regarded as dialects or as languages in their own right. This is not the place to examine the arguments involved in that debate. In our work on the Project we have decided to regard these Creoles as dialects of English. This is because most of the children can with little conscious or systematic teaching modify their own language to the point where they achieve a classroom dialect that is relatively close to their teacher's standard. The point to remember is that most of the paper refers primarily to West Indian children and that many of these find themselves in an extreme dialect speech situation. The paper first of all considers the inadequacy of definitions of dialect speech which are too rigid. It then discusses some of the ways in which dialect can influence the performance of children in school. It goes on to consider the notion that dialect is an indication of linguistic deficit, and concludes by summarising the attitude of the Project towards dialect in the preparation of teaching materials.

I. THE DIALECT CONTINUUM

WHEN describing a non-standard dialect the usual procedure is to compare it with the standard language and then to list the points of difference. It is then stressed that these contrastive features are not mistakes, but the product of different sets of rules which operate in the dialect. This method of description is excellent for most purposes. However, if one wishes to study the way in which dialect interferes with the linguistic performance of a child in school the description must be less static.

It is necessary to remember, for example, that in Britain the dialect speaking child is rarely restricted to a single dialect with a rigid set of phonological and grammatical rules. Rather he starts at school to

operate along a dialect continuum. In most cases this is one dimensional, with the home dialect at one end and the school dialect at the other. In the case of a Creole speaking child the contrast between his home dialect and the immediate neighbourhood dialect introduces a second dimension which seems to increase the child's linguistic flexibility and sensitivity to varieties of lexis, phonology and syntax. It is difficult otherwise to account for the speed and skill with which many West Indian children acquire a more standard dialect for formal situations like school.

In addition to the differences in the child's speech brought about by different social contexts, a closer examination of quite short stretches of dialect speech shows that some of the 'rules' fluctuate in strength. Labov (1967) has shown that many of the distinctive features of negro dialect are not invariable, that it is possible to measure their prevalence and to describe certain contextual conditions that influence the choices made (automatically) by the speaker. It is, for example, a feature of various Negro dialects (and of many West Indian Creoles) that certain final consonant clusters are reduced. Labov showed that the amount of final /t/, /d/ reduction (67%) is not much greater than is the case with the white speakers (57%), while the /s/, /z/ reduction is more distinctive of Negro dialect (50%: 14%).

To take another example, it is a 'rule' in Jamaican Creole not to mark the simple past tense by inflection. Consider, however, the following example of Jamaican Creole quoted by Cassidy (1967). It is part of a story told by a cane-field labourer near Morant Bay in Jamaica:

'Nou, (Breda Anansi), pik up iz myuuzik man, wich iz tree kakruoch, dat i tuk intu a guodi, an wen ing riich about a aaf mailz, tu di King giet, im straik up di myuuzik man.'

A standard translation would be:

'Now (Brother Anancy) picked up his music men, who were three cock-roaches, that he took in a gourd, and when he reached about half a mile from the King's gate he struck up the music men.'

In the original Jamaican Creole, four of the verbs (pick, is, reach and strike) are not inflected, though one verb (took) is inflected. This ratio of uninflected to inflected past verbs (4:1) is maintained throughout the story. In the children's school dialect the proportion of inflected past forms increases considerably. The following is a part of a discussion about the merits of air travel between a teacher and three twelve year olds recently arrived from Jamaica:

- Glenville: I never like the food, not all of it, only liked the spaghetti I did.
 Pauline: I never eat any spaghetti.
 Sylvester: I only drink the water.
 Glenville: I drink the orange and the tea.
 Pauline: We went to sleep on the plane and I first wake up and saw the telly was on.
 Glenville: I only went to sleep once I did.

2. PERFORMANCE IN SCHOOL

It is not easy to summarise the position of the Creole speaking child at school, but certain generalisations can be made:

- (1) He will soon speak at least two dialects.
- (2) The formal school dialect will contain certain Creole features, but it will be intelligible to non-Creole speakers. (Spoken Creoles can be entirely unintelligible to outsiders.)
- (3) In spite of this facility with the school dialect, Creole is the child's first language. At various points in his school career this Creole background places the child at a considerable disadvantage.

Attitudes vary about the role of dialect in school. Attitudes are also changing. Tolerance is on the increase. Correctness (i.e., conformity to standard rules) is less important in the hierarchy of English teaching objectives. There is a growing awareness that there are other criteria for judging 'good English', and that at certain stages in the child's education these criteria outweigh the value of insisting on standard spelling, standard grammar etc.

However, the instinctive reaction of most teachers to such features as a double negative is still 'it's wrong', rather than 'it is not standard, but very common in various regional and social dialects'. It is difficult to know exactly what effect it has on young children to hear their own language, the language of their parents, described as wrong. In the case of a child for whom school represents a fair amount of failure in other respects this extra hurdle will certainly hinder his general school performance and may have much more serious psychological implications. A child's own language is a very personal possession.

a. Production—the written language

The two most obvious areas of dialect interference are seen in the children's writing. It will affect the spelling and the syntax. Any child learning to read and write comes face to face with the fact that the

standard written language and his own spoken language do not match each other very well. At the age of six the Jamaican Creole equivalent of the notorious 'The cat sat on the mat.' would be /dikyatsitpandimat/. It is written out without spaces between the words. This is because a five year old child cannot automatically and easily analyse and sequence the units of his spoken sentences in the manner required for writing. Mackay and Thompson (1968) report that the lexical items (words with high information content) are easily recognised and handled, but that there is some doubt in the child's mind about the status of the grammatical elements in the sentence. This is true for children whose spoken language corresponds fairly closely in syntax and lexis to standard English. For a 5 year old Creole speaker the intellectual problems of analysis and matching are much greater. In addition to analysing his spoken language into the appropriate sequence of units for writing, the dialect speaker has to fit the sounds of his spoken words to the written symbols. Teachers report that West Indian children who make reasonable progress learning to recognise whole words sometimes fail badly at phonic word building. This is hardly surprising when even the spelling rules which convert received pronunciation speech into writing would not win prizes for simplicity or logical consistency. But at least with that rule system the teacher can appreciate the ambiguities and make allowances for them.

To return to the Creole sentence above, the three words 'cat', 'sat' and 'mat' each have different central sounds, /ya/, /i/ and /a/, which must all be represented by the letter 'a' in the written sentence. It takes considerable time and sensitivity for a teacher without special training to make allowance for ambiguities of that sort even assuming that her analysis does not stop at a judgment of 'wrong pronunciation'.

b. Reception—the spoken language

As mentioned above the dialect speaking child's approach to *written* English quickly reveals some of the more obvious problems. It is more difficult to assess the submerged difficulties that the children experience in their *oral* language transactions in the classroom. In the infant school the Creole speaking child is sometimes unintelligible. Differences of syntax and pronunciation will make a simple sentence hard for the teacher to understand. Unusual intonation and stress and a couple of unfamiliar lexical items will make the same sentence completely unintelligible. The most difficult question to answer, though, is how much the child understands the teacher.

Speaking to a group of children, a teacher can see if they are all listening. She cannot necessarily tell if they are all fully understanding. When a child fails to respond in the expected way to a question or an instruction, she can only guess at the reason. It might be the result of poor concentration, a short memory span, or limited experience. It might be a question of the child's confidence or intelligence. All these reasons are likely to suggest themselves before the possibility of dialect interference is considered. Yet if the teacher, a skilful listener with vocabulary and experience far greater than the child's sometimes fails to understand the child's dialect, the odds are that that child in an infant school frequently fails to understand the teacher.

Until some delicate testing procedure is available to measure the extent to which dialect interference is a factor in comprehension failure in young children, it is only possible to guess at the disadvantages of the Creole speaking child in the infant school. It should be mentioned, though, that Keislar and Stern (1968) investigated the hypothesis that Head Start children who receive instruction in a familiar dialect will learn more than a comparable group who receive the same instruction in Standard English. Their results gave no support at all to this hypothesis. In fact the groups instructed in Standard English achieved better results!

Whatever the actual situation is for the Jamaican Creole speaker in the infant class, it is certainly true that most suppositions made by linguists about the situation need testing before they can be confidently accepted. If however it is accepted that a Creole speaking background is likely to decrease the child's understanding in the infant school, there is some evidence that as the child grows older it becomes a less critical factor.

It is a truism that a child's ability to understand language exceeds his ability to produce it. This being so, the child's development of a more standard dialect for school use is likely to indicate an ability to understand dialects which are closer still to the standard.

The research (Wight and Norris, 1970) that preceded the Project's present development of teaching materials also suggested that where West Indian children do have difficulty in oral comprehension—Creole interference is not the principal cause. In this research phase a test was developed to examine the effect of Creole interference in situations where the teacher is talking to the whole class. The test was given to eight junior school classes in the 7-9 age range. It contained

50 items, 25 of which were designed to present special difficulty to Creole speakers. The other (control) items were designed to be of equal difficulty to both speakers of Creole and of Birmingham dialects. The special West Indian items focused on grammatical and phonological points of difference between Jamaican Creole and Standard English.

In Jamaican Creole, for example, the standard rules of subject verb agreement do not apply and there is a tendency not to mark noun plurals with the morpheme 's'. A sentence which begins 'When the horse comes back ' contains two grammatical clues for most English speakers that only one horse is likely to come back. It was assumed that for Jamaican Creole speakers these clues would be obscured. Therefore clauses like this were embedded in short stretches of narrative and the children asked to answer such questions as: 'How many horses were expected back?' The assumption was that West Indian children would find particular difficulty with items of this sort because of dialect interference. In fact the results obtained were far from those expected. By and large the West Indian children (both those born in England and those recently arrived from the Caribbean) scored significantly lower on *all* the items. There was little evidence that the special West Indian items were creating relatively more difficulty than the control items. There was an exception to this. Children recently arrived from the Caribbean did have more difficulty with those items based on Creole pronunciation.

This test result suggested that Creole interference was not the principal cause of the children's comprehension failure. A small scale experiment carried out the year before also supported this view. In this experiment a number of 12 year old West Indians who had been in England a relatively short while played a word association game. The teacher said a word and the children responded by writing down the first word that came into their minds. Many of the words were potentially ambiguous to the children because of differences in Creole pronunciation. By examining the children's responses it was possible to see which word the children had 'heard'. For example, a Creole speaker will pronounce the number 3—/tree/. If the stimulus word therefore was 'tree', the associated response 'leaves' or 'wood', might be expected, but a response of 'four' or 'number', etc., would indicate Creole interference. Only 6% of the children's answers to potentially ambiguous stimulus words showed evidence of dialect interference. A number of the children who played this word associa-

tion game spoke quite broad Creole themselves, yet they were able to adjust to the pronunciation of English teacher so well that with impressive consistency they could interpret the teacher's words without the help of any context. This was a small scale experiment, but it suggests very sophisticated skills on the part of these children as they adjusted to a system of pronunciation quite different from their own.

The tentative conclusion to be drawn from all this is that although dialect will continue to have a marked influence on the child's language *production*, he will, provided he has reasonable exposure to the dialect of the teacher and the school, develop skills of language *reception* to cope with the contrasts between Creole and Standard English. This is not to say that there are not difficulties of comprehension for these older children, but it is likely that for them the principal sources of difficulty lie elsewhere. If there is dialect interference it operates like a filter on the communication channel when there are other non-dialect reasons which already make the communication difficult—such as the speed, or the intellectual complexity of the teacher's language, the novelty of the subject matter, etc.

3. DIALECT DIFFERENCE AND LINGUISTIC DEFICIT

It is obvious that Jamaican Creole affects the child's ability to produce Standard English. There is though a much more fundamental consideration. Do the formal characteristics of a dialect—its lexis, phonology and especially its syntax have an effect on the child's ability to use language efficiently (as opposed to respectably)? Does a non-standard dialect automatically indicate linguistic deficit?

Now is not the time to examine the problems involved in defining or measuring linguistic deficit. It is assumed for the moment, that tests of verbal ability do measure important aspects of linguistic proficiency. On these tests middle class children tend to score higher than working class children. Also it does not need to be argued that middle class speech is likely to be more standard than that of working class children. Both these propositions may be true, but it needs to be demonstrated that there is a causal relationship between them.

There is moreover a very important point to remember. Some tests of language development examine the ability of children to produce Standard English. Berko's ingenious test examines, for example, the children's ability with the plural 's' morpheme. The Illinois test of psycholinguistic abilities also contains a section in which success

depends on the mastery of Standard English grammatical rules. A verbally gifted Creole speaker might fail in sections of tests of this kind, but it would be a demonstration of linguistic difference not deficit.

In other words the conclusion that dialects are responsible for language deficit is sometimes the product of a circular argument which first defines linguistic competence in Standard English terms and then proves that dialect speakers are incompetent.

Baratz (1968) conducted an interesting experiment which makes this point perfectly. She constructed a sentence repetition test that contained 30 sentences—fifteen of these sentences were in standard English.

e.g. When the teacher asked if he had done his homework, Henry said, 'I didn't do it.'

The other fifteen sentences were in Negro non-standard:

e.g. When the teacher aks Henry did he do his homework Henry say I ain did it.

The subjects of the experiment were drawn from a Washington Inner City Negro school and a suburban white school. The white subjects were significantly better than the Negro subjects at repeating the Standard English, but the Negro subjects were significantly better at repeating the Negro non-standard.

There is an expansion of the earlier simple question which deserves more serious examination. Is a non-standard dialect intrinsically a restricted type of language which therefore limits certain types of communication and retards the development of certain conceptual skills? A typical argument runs as follows:

- (a) Jamaican Creole does not regularly indicate past tense.
- (b) Jamaican Creole does not have the same number of tenses as English.
- (c) Therefore, Jamaican Creole speakers have a restricted general concept of time.

This type of argument is difficult to answer conclusively. It implies that a Greek soldier doing his national service round the walls of Troy had a much more elaborated concept of time than we do simply because at first sight Homeric Greek has a much more complex tense system than standard English. Moreover there are areas where Jamaican Creole syntax makes more delicate distinctions than standard English. Is it the case that in these areas a standard English speaker has restricted concepts? For example, Bailey (1964) has

shown that the sentence pattern *subject + verb 'to be' + complement* breaks down into three different sentence patterns in Jamaican Creole.

- (a) When the predicate is an adjective there is no copula: *di biebi ogli* 'The baby is ugly'
- (b) When the predicate is a noun the copula is *a*: *di biebi a gyal* 'The baby is a girl'
- (c) When the predicate is a locative phrase the copula is *de*: *di biebi de anda di tree*. 'The baby is under the tree'.

Can one conclude from this that Standard English speakers have a restricted general concept of predication?

4. FAMILIARITY AND FUNCTIONAL EFFICIENCY

Other evidence about the restrictive nature of dialect is sometimes drawn from the comparative studies of children's language. These studies take as a measure of linguistic skill the amount of complexity and variety in the children's language. A measure might be the proportion of subordinate clauses or adverbial phrases—the variety of vocabulary—even the proportion of sentences which lack a main verb.

In an interesting short study of this sort Mordecai (1966) divided West Indian children into three groups according to the length of their stay in England. In one of the sub-tests the children were asked to describe to the tester a series of pictures—the subjects of which were chosen carefully to avoid cultural bias against the most recent arrivals. The success of each child was measured by giving a score to the most complex sentence in each description. During the early stages of the Project a similar method of collecting children's language was employed. The tentativeness of the language and the lack of fluency was quite marked.

The most fluent descriptions were made by a very articulate self-confident 12 year old girl:

This is a child's lady . . . nurse. She's in the hospital dressing . . . cleaning out a little baby's hairs and he's got a wound on his forehead. And there is his shirt lift up and you can see his pure tummy. And her hands is betwixt the cot bars. This is a chinese lady. She's looking after the baby. She's a nurse and she has got on a watch and a nurse cap and a nurse dress. There is a saucepan there as well.

When the same children were asked to improvise a scene depicting

the situation at home the morning after an imaginary robber, this girl slipped easily into the role of the bossy mother:

Look! There is footprints on the windowsill. It seems like we have got burglars here last night! Shall we look see if we lost our money? Look! There ain't any money in the drawer. Let's call the police! Hallo is that BAR 999?

Yes, this is BAR 999, can I help you please.

O yes you can. It seems like we have got burglars here last night, because they have thief all of the money we have got in our drawer and then we have seen their footprints on the windowsill.

The contrast between these two stretches of language is obvious. There is a great deal more subordination and complexity in the second sequence. Although one hopes that robbers were not regular occurrences in her home—the language of the home and her mother's role were both familiar—and so fluent, complex, if not entirely standard language was the result. Describing a picture was on the other hand an unfamiliar task, even though she knew a fair amount about hospitals—from her mother who was a nurse. The result was a series of shorter less complex sentences.

Many studies which attempt to measure the development of children's language skills by examining factors like complexity run into this difficulty of creating a familiar context where the subjects can display a reasonable range of the resources available to them.

In observing children using the Project's pilot materials it appears that dialect itself very rarely effects the *functional* efficiency of their language production, *unless* part of the child's task is actually to produce standard English. In a situation, for example, which calls for enquiry, the children rarely fail because of ignorance of the Standard auxiliary inversion rules or the appropriate intonation patterns. They do fail frequently because of difficulty in processing adequately the answers they receive—or because they are unaware of the power and relevance of certain lines of enquiry. This distinction between the form and the functional efficiency of children's language is discussed more fully elsewhere (Wight, 1971), but it is one of the reasons why only about a quarter of the Project's teaching materials focus on problems created for West Indian children by Creole.

5. SOME CONCLUSIONS

The Project's attitude towards West Indian children and their dialect can be summarised simply:

(1) The most important factor for a Creole speaking child is probably the attitude of the teacher and the school. Teachers need to be as informed as possible about Creole and able to approach the children's language learning problems from the child's point of view.

(2) Many West Indian children do have a range of severe language learning problems which have little to do with dialect per se. These are problems shared by many English children. The bulk of the Project's teaching materials focus on these non-dialect and general language development areas, and are not exclusively for West Indian children.

(3) One unit of the four which make up the materials does focus on dialect. Its aims are twofold. It is designed to help West Indian children write Standard English focusing on certain areas where there is persistent dialect interference. Its second, less publicised intention is to bring to the notice of the teacher many of the issues discussed in this paper.

Even with this fairly restricted aim we have been conscious of the danger of appearing to attack the child's own language. We hope to avoid this by presenting the Standard English structures which are to be taught, in the context of the conventions of the written language, emphasizing that nobody writes in exactly the same way as they speak.

The most effective way to guard against attacking the dialect is simply to place a positive value on it in class. Dialect differences can be considered objectively and older children can be encouraged sometimes to explore their own dialect and write in the style and manner of their culture. A teaching experiment (Muehl 1970) with groups of Negro teenagers asked them to do a 'cooltalk' translation of the story of Faust. Quite apart from helping the students actually to enjoy a visit to Gounod's opera, the results are worth reading in their own right. The following is a version of Act I, the syntax of which has been standardised a bit, one suspects, by their teacher.

This old dried up cat named Fred was sittin down at the table one night, trying to dig on his philosophy. The folks outside were buggin his case, cause he was thinkin about goin sidewise. They kept on buggin his high. And then comes this cat, this cat from below the world, his main walk boy Satan. This cat put down the rap to him. 'I know all your git up and go has got up and went, but drink this juice man. Put glide in your stride, cut in your strut, and fill the hole in your soul! Make everything want to be mellow. Like look, Jack, drink this taste, and everything will be all right. We'll let you play the Sidney Poitier role.' So the dude turns around and what does he see but this babe standin there as cool as can be. So Fred agrees to turn in hisself to the happy huntin grounds, and give his soul to the man.

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SOME OBSERVATIONS ON THE LANGUAGE OF PRE-SCHOOL CHILDREN IN AN EDUCATIONAL PRIORITY AREA

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I. INTRODUCTION

THE Birmingham Educational Priority Area (E.P.A.) Action/Research Project has been conducting an investigation into the effectiveness of pre-school language intervention programmes. Large scale pre- and post-testing has been completed, using the English Picture Vocabulary Test and the Reynell Developmental Language Scale and the present article draws upon some of this data, without, at this stage of the analysis, seeking to present a full account of the pre-school experiment.

The main source of evidence for the statements which follow are verbatim conversations transcribed in L.E.A. nursery schools and playgroups; verbatim written records of all speech uttered when 208 pre-school boys and girls were tested on the Reynell Developmental Language Scale (R.D.L.S.), together with an analysis of the results of this test, which has separate scales for Expressive language and Comprehension; and an analysis of the scores of 280 pre-school boys and girls on the English Picture Vocabulary Test (E.P.V.T.)

2. THE TESTS

The R.D.L.S. provides separate scales for Expressive Language and Verbal Comprehension. There are two parallel scales, A and B, but only Verbal Comprehension A was required for the present sample: this has nine items and is scored to give a raw score, age level and a standard score. The Expressive Language scale has three sub-scales entitled respectively, language structure, vocabulary and content: it gives a raw score for each sub-scale and an age level and standard score for the scale as a whole.

The Scales were evolved in a clinical setting: 'the selection of questions, test material, the order of difficulty, the developmental

stages and the separation of particular features for assessment, were evolved in the course of clinical use'. This painstaking procedure has enabled Dr. Reynell to produce an instrument admirably adapted to the needs of a tester of young children. The numerous toys and interesting situations depicted enable one to engage the children's interest immediately and even the most hyperactive child could eventually be inveigled into attention. It is also, particularly in the 'Content' section of Expressive Language, open-ended, and a considerable corpus of speech samples can be gathered if testers work in pairs, with one recording and the other concentrating on the administration of the test—a division of labour which seemed to have no effect whatever on the children's performance. All tests given were scored by the present writer, so as to ensure consistency in marking procedures, which are, however, for the main part, quite explicit.

The procedures in the R.D.L.S. are elaborate and time consuming, each child often requiring forty-five minutes or even an hour to complete. By contrast, the E.P.V.T. is an extremely simple test to administer. The child is shown four pictures and asked to identify one which corresponds to a word spoken by the tester. Identification can be made, so far as pre-school children and infant school children are concerned, simply by pointing to the correct picture. With older children, a group form of the test is used and this requires the completion of a very simple record form.

The E.P.V.T.'s are a British standardisation of the American Peabody Picture Vocabulary Test. They assess levels of 'listening vocabulary'; but, it is claimed by Brimer and Dunn (1965), 'they can be more generally interpreted as measures of verbal ability.'

Some controversy surrounds this latter statement. The correlations quoted by Brimer seem convincingly high but they refer to an older age group. It may be safer to restrict the interpretation of what is measured, particularly in so far as pre-school children are concerned, within the definition given on page 34 of the *Manual*:

The E.P.V.T.'s do not purport to answer the question, 'How many or what kind of English words does this child know?' but rather, 'At what level of difficulty does this child listen with understanding?'

The E.P.V.T.'s conform to the construct 'listening vocabulary'.

3. THE CHILDREN

There is almost universal agreement as to the existence of a language deficit among children in an E.P.A. A recent statement from a much respected source may be taken as typical:

The language of the children with whom we worked was conspicuously retarded. This was true both of spoken and unspoken language: the children's language was poor in vocabulary and syntax, and their auditory discrimination was poor, especially when it came to final consonants. The failure to use final consonants adequately, the limited syntax, and the poor vocabulary all appear to derive from the language background of the children. (Gray and Klaus, 1968).

There is then the ritual citation of Bernstein:

In homes where the restricted code is the usual form of language interaction, most of the meaning must be picked up from other aspects of the situation. We noticed that the children, when given verbal instructions, would often look for cues either in the behaviour of others or in the teacher's facial expression or gestures before responding.

Now, while these observations may be accurate enough for some children in the E.P.A., they signally fail to account for the wide range of linguistic behaviour which is to be found in a multi-ethnic society. Knocking on doors in now-demolished streets in Balsall Heath, Birmingham, one would have met:

Mrs. J. from Pakistan who spoke no English. She came to Birmingham with her children in 1966. There were seven children, two at work, one at a local Secondary School and three at a local Primary School and one three years old. The husband spoke English having served with the armed services in North Africa in the Second World War. He worked at a Bakery, alternating day and night shifts once a fortnight. The family owned the house it occupied (no other family lived there); it was comfortable, clean and well-furnished by any standards.

Mr. and Mrs. W. were Birmingham people with five children; four were at school, one eleven months old. They rented a private house which they thought had a ten year life. Husband worked permanent nights at a car factory. Since he went off at 7 o'clock every night there was little opportunity for social life.

Mrs. Wh., a Birmingham girl married to a Jamaican, with six children.

Mrs. T., a Greek Cypriot who had lived in Britain for fifteen years.

A couple from Glasgow with five children aged from three to twelve years.

Mrs. Q. from Glasgow, married to a Pakistani who was a graduate of Birmingham University and owned a restaurant. There were six children aged three to eleven years.

Mrs. S., who came here from Kenya eight years ago and whose husband, unlike most Kenyan Asians spoke little English, so that the five children were initially non-English speaking.

Mrs. S. A young Irish woman with four children whose husband was a lorry driver.

Mrs. S. A young divorced Birmingham girl with five children.

Mrs. I., and her husband, a Biafran couple, a stable family with four children.

Mrs. G., from Wales, married to a local man for eight years, with three children.

Children from families like these are represented in the speech samples, with the obvious exception of those who were, at the time, completely non-English speaking.

4. THE CHILDREN'S LANGUAGE

One has but little confidence in those who seek to explain the intricacies of human speech and thought processes by reference to the behaviour of lower primates. However, Washoe, a chimpanzee reared by Dr. J. R. Gardner and his wife, has been given the opportunity to learn a sign language as used by deaf and dumb human beings, and her experience seems more relevant than that recounted in most of these experiments. Washoe, it was observed, acquired a considerable repertoire of signs but not the capability of assembling these signs into sentences. She had a vocabulary but no syntax.

Exactly the opposite would seem to be true of pre-school children in an E.P.A. They have syntax but a very limited vocabulary. Compared with middle-class children, they are severely retarded on their E.P.V.T. Scores; but examples of a wide range of syntactical patterns can readily be collected by anyone who cares to listen carefully to the children's conversation in a good nursery.

It will be as well, at this point, to lay to rest the hoary old myth that difficulties with 'structure' are responsible for the undoubted learning failure to be discerned in schools in an E.P.A.

(i) *Syntactical Structures*

Paula Menyuk, in two famous papers (1963; 1964), gave an outline of a children's grammar, in the transformationalist tradition. Her sample of 96 children (48 nursery, 48 first grade) was drawn entirely from the upper 24 per cent range of a middle-class population. 79 per cent of the nursery school children's parents were in the occupational categories of professional or semi-professional and managerial. The speech samples were gleaned by procedures not unlike the present experiment—responses to a picture test, supplemented by conversation with an adult and some recordings of peer-group speech.

The great majority of the speech examples recorded below have been drawn from pre-school children whose socio economic status (S.E.S.) was within the Registrar-General's Group V. Many of the children had additional social handicaps, such as one parent absent; large, illprovided families; very poor home conditions. It was therefore, a source of some surprise to the present writer to be able to find examples of every structure except one (Passive): and the interview

situation was such as to render the use of a passive almost impossible.

Analysis by social class of nursery children's speech: according to a grammatical scheme of Paula Menyuk (phrase structure and morphology levels) (S.E.S. is given as a Roman Numeral in brackets)

Transformations

Simple Transformations

1. Passive
2. Negation—They're not allowed fireworks (V)
3. Question—When my Mom comes, shall I go? (V)
4. Contraction—There's some there (V)
That's a real pencil (V)
I can't stand this one up. (V)
He's digging—he's carrying . . . my Daddy's . . .
She's got . . . I'll put this away. (V)
5. Inversion—Look at that baby, it's sitting on there (V)
That picture they dig (V)
6. Relative question—What's this? (V)
7. Imperative—Look, at that! (V)
8. Pronominalisation—There ain't no dinner on there, look. (V)
9. Separation—Shall I git it out (V)
10. Got—I've got this cardigan (V)
11. Auxilliary verb—
(a) to be this is black . . . that's our pussy cat, playing (V)
(b) have we've got a lot of boats in our den, upstairs (V)
12. Do—Don't know. (V)
13. Possessive—That is Daddy's shed and that's his door (V)
14. Reflexive—dress yourself (III)

Generalised Transformations

15. Conjunction—There's a little duck and there's a big one (V)
16. Conjunction deletion—I hittin 'em and grab holt of 'em and lock 'em up and put the bolt on and a piece of wool round (V)
17. Conditional—We've got some grass at our house. Not so much grass though. We've got lots really but there's stingers in it if you lie down (IV)
18. So—Throw some paper out of the window so I can go to school.
Run I do. I can win my Dad and my Mummy (III)
19. Causal—Playing with the soil, and the Daddy's playing with the digger, 'cos they're pulling the bricks out of the grass (V)
20. Pronouns in conjunction—Boy's playing with darts—oh no, he's eating his dinner (V)
21. Adjective—We've got a Ford car—it's black (V)
22. Relative clause—I bet that can go in water, can't it. (IV)
Do you know what Robert threw at us (III)
23. Complement—
(a) Infinitival—We've been in a boat to see fishes and animals (V)
(b) Participle—Look at that baby, it's sitting on there (V)

24. Iteration—I don't like apples and I don't like 'nanas (V)
 25. Nominalization—He's bringing the washing in the basket.
 She's doing the shopping.
 Oh, my painting's up there. (V)
 26. Nominal compound—bonfire party (V)

There are examples of a very large number of other structures.

Blue and a bit of grey it got

A bit of blue and a bit of grey (III)

What, is Caroline going to play with your toys?

When I'm six I can't play with your toys.

When I'm eight you can teach me.

When I'm in very top class you can't teach' . . .

Pretend I get upstairs and you don't wake up (III)

I can see a big lorry just going past (III)

It ought not to be supposed that in noting the *competence* in syntactical structures displayed by individual members of a group of children, one is arguing that all children at any one time would *produce* such structures. It is argued that most of those within the normal range of ability *could* produce most of the structures (and their scores on the Reynell 'Structure' sub-test confirms this)—were it not for inhibitions towards verbal expression which have been implanted in the child as a result of his deprived linguistic environment. These children have learned that it pays to keep quiet, especially in the presence of 'authority' figures; they lack the assurance in new situations which comes from previously experienced successes. Just how much a child's linguistic growth would be affected by this kind of elected silence, can be seen very clearly in Halliday's (1969) brilliant exposition of relevant models of children's language. Readers will recall that there are seven such models to be internalised and almost all would be affected, but particularly those he names the personal, the heuristic and the representational.

Deprived children acquire syntax very readily, then, but their competence is masked by their acquired distrust of verbal expression. Two practical points follow from this.

Syntax is in a period of over-learning by the time the child reaches a school situation. It is unlikely that what has been taken into the self in this way can be unlearned, whether socially acceptable or otherwise. This is wisely recognised in Schools Council Paper 29, (1970) dealing with the language of West Indian children; the authors setting as goals the acquiring of patterns *alternative* to the first learned, so that the child eventually learns to switch registers.

Secondly, if the child does not produce evidence of syntactical

competence, the correct procedure will generally be to encourage speech through more one-to-one child-adult contact and through a stimulating and encouraging linguistic environment—not through a series of drills on sentence patterns. The language intervention programme used in the present E.P.A. research was the Peabody Language Development Kit (P.L.D.K.) and it was notably successful with some groups; but it is reasonable to conclude, in the light of the above discussion, that the authors were in error in placing so much emphasis upon language 'drills'. What seemed far more important was the emphasis on well-organised oral work, conducted every day in small groups, which allowed the adult to encourage and draw-out the language imprisoned there (almost like Moses striking the rock!).

(ii) *Vocabulary*

This ready acquisition of syntax is in contrast to the evidence of the scores on the E.P.V.T. It was possible to test 280 children (the 208 Reynell tested children, plus 72 E.P.V.T. only), in thirteen pre-school units one of which was a 'middle-class' playgroup (Unit 13) for purposes of comparison.

TABLE I
E.P.V.T. SCORES OF ALL SUBJECTS PRE-TESTED IN THE
BIRMINGHAM E.P.A. PRE-SCHOOL EXPERIMENT

Pre-school unit Code No.	E.P.V.T. Raw Score			E.P.V.T. Standard Score		
	Mean	s.d.	N	Mean	s.d.	N
1	12.9	9.9	43	88.5	19.6	43
2	13.7	8.0	20	93.2	9.5	20
3	14.8	8.0	19	98.2	10.7	19
4	13.4	6.8	25	94.8	7.4	25
5	17.4	10.0	25	101.1	12.6	25
6	12.3	9.8	17	88.6	15.5	17
7	11.2	8.5	18	87.5	15.2	18
8	9.9	7.2	14	86.4	13.5	14
9	14.0	10.3	17	87.2	17.0	17
10	12.0	6.5	24	92.9	8.8	24
11	11.3	7.8	25	88.2	19.9	25
12	11.2	4.9	12	94.9	8.2	12
13 (control)	26.2	6.0	21	108.0	7.2	21
Total boys	14.4	9.8	148	94.2	13.7	148
Total girls	13.6	8.4	132	91.8	16.8	132
Total	14.0	9.2	280	93.1	15.3	280

The contrast between the E.P.A. and the middle-class units is immediately apparent. There were 86% high scorers in U.13 compared with 7%-42% in the E.P.A. Units. Moreover, the only other Unit (5) with a substantial admix of higher socio-economic-status (S.E.S.) children also had 60% high scorers on the E.P.V.T. Higher S.E.S. equals better vocabulary score; and this gap was not bridged after a year's intensive language programme.

The scores on the E.P.V.T. certainly appear low, even when one leaves out the extra E.P.V.T. subjects (who included some Asian children with enough English to score on the E.P.V.T. but not enough to tackle the Reynell).

TABLE 2
E.P.V.T. SCORES OF SUBJECTS ALSO
TESTED ON R.D.L.S.

pre-school unit	E.P.V.T.				
	raw score		standard score		N
	mean	s.d.	mean	s.d.	
1	16.3	10.0	93.0	21.0	
2	14.1	8.0	93.8	9.4	25
3	14.8	8.0	98.2	10.7	19
4	13.1	7.2	94.2	7.4	19
5	19.7	9.2	104.7	11.2	21
6	12.3	9.8	88.6	15.6	15
7	11.7	8.9	87.3	16.2	17
8	9.9	7.5	85.8	13.9	16
9	14.0	10.3	87.2	17.0	13
10	11.1	6.1	94.3	8.4	17
11	12.2	8.2	92.8	8.9	18
12	13.0	4.8	98.5	7.3	20
13	—	—	—	—	8
Total boys	14.0	9.4	94.0	13.0	0
Total girls	13.3	8.0	92.2	15.3	108
All pre-school exp. children.	13.6	8.8	93.1	14.2	100
					208

However, according to a study cited in Brimer and Dunn (1965), the mean E.P.V.T. score of what was claimed as a representative sample of 124 Birmingham children aged 10 years 9 months to 11 years 3 months was 92.92 (s.d. 17.68).

The over-all mean standard score of 93.1 (Table 2), attained by the E.P.A. pre-schools (range 85.8 to 104.7), was higher than the mean of these fourth year juniors, said to be a representative sample of Birmingham children of that age-group.

It seems unlikely that the comparison between these figures can be taken at face value. All the E.P.V.T.'s are derived from the construct 'listening vocabulary', but the norms for the younger age groups have only recently been standardised and may have to be reconsidered.

Nevertheless, the results are as reported and seem to bear out the existence of the phenomena labelled in the U.S.A. 'cumulative deficit'—the children's language performance becomes worse as they proceed through the schools.

One would not at present wish to make too much of this statement, since the focus must remain on the pre-school child. The pre-school E.P.V.T. scores are low and according to one study they become worse. This aspect of language (the paradigmatic?) is badly affected by social deprivation, when contrasted with the performance of middle-class children—much more than the syntagmatic aspect, by the same criterion.

5. DISCUSSION

There is a major controversy among those versed in linguistics (the outsider hesitates to intervene but, as so often in education, has to decide as best he can while the debate continues and new evidence is unearthed): this controversy is concerned with the influence of social experience on the acquisition of language. On the one hand are those who, like Lenneberg (1968) assert that 'the most important differences between the pre-language and the post-language phases of development originate within the growing individual and not in the external world or in the changes in the available stimuli.' This, however, is not the view of Glyn Lewis (1969) who rejects the theory of the innateness and uniqueness of linguistic structures as counter to the experience of a large body of informed opinion—'teachers and those who have studied the effects of sensory and cultural deprivation and especially linguistic development'. 'The development of language is therefore not due to the spontaneous emergency of an inborn set of grammatical structures, but to the impact of social factors and to the provision of cultural materials on which our neurological processes are able to work.'

The present findings would certainly seem to support Lenneberg's (1966) statement that 'children suffering from severe parental neglect, whose mothers may be frank psychopaths, or whose parents are deaf-mutes and whose main contact with normal speech comes through television or indeed, who are raised in orphanages and are not exposed to much talk, still develop language in all of its infinite abstract characteristics (such as is comprised by syntax or the very act of naming objects and relations) within the first five years of life. . . . Unless a child is literally raised in a closet he will make use of the language stimuli surrounding him, however impoverished these might be in comparison with the so-called normal ambient.'

Halliday's explication adequately expresses the complexity of the network of interactions between a child's language and his personality. The dimensions of language difficulties thus exposed may be somewhat different from those raised in Glyn Lewis's paper; they fall under the headings suggested by M. M. Lewis (1968), of orectic development ('the emergence of the child's personality, the growth of his social life, the differentiation of his aesthetic attitudes and his ethical development'). It seems that the deprived child is likely to be inhibited from making use of his undoubted competence in the syntagmatic aspect of language because of retardation in his orectic development and that the aspects of language in which difficulty will be most clearly manifested will be those designated by Halliday as the interactional, the personal and the heuristic.

There is a growing consensus as to the relative ease with which children's syntagmatic development proceeds; but progress in the paradigmatic aspects of the mother tongue is a much more complex and far reaching matter. M. M. Lewis emphasised the manner in which social reinforcement stimulates the formation of concepts through an elaboration of perceptual discrimination.

'The perceptual basis of conceptual thinking has, of course, long been recognised. In the traditional terms of logic, the process was formulated many years ago by Stout in the pithy statement that the universal is implicit in the percept. What has been added by recent workers is an increased emphasis upon the importance of social interchange in promoting the linguistic symbolization which aids the "abstraction" that is involved in conceptual thinking.' (Lewis, M. M. 1968).

This goes some way towards explaining why the undeniable constraints on social intercourse which children in the E.P.A. experience,

affect their paradigmatic development so much more than their syntagmatic. 'The deprived child's verbal weakness is so overwhelming that it blinds one to his more subtle but basic deficiency. This deficiency is the lack of a symbolic system of thinking.' (Blank and Solomon 1969).

The aspects of a language development programme most likely to influence the children's behaviour will certainly not be those which emphasise syntactical structures. We should look for an explanation of any successes to those aspects of the intervention programme which emphasise the universal implicit in the percept; and in learning situations which permit teacher-child interactions with the subsequent release of orrectic inhibitions and the opportunity for the adult's speech models to be absorbed and internalised by the child.

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BOOK NOTICES

RICHARD J. CHORLEY and PETER HAGGETT (eds.). *Frontiers in Geographical Teaching* (Methuen, 2nd. Edition, 1970, £1.25)

THIS collection of eighteen essays on the concepts, techniques and teaching of geography aroused widespread interest and provoked considerable thought when it was first published five years ago. Part I deals with the concepts and separate chapters are devoted to the philosophy of the subject, geomorphology, climatology and human, social, economic and historical geography. In Part II consideration is given to the techniques of geomorphology, scale components in geographical problems, field work in rural and urban areas, quantitative techniques in social geography and the use of geographical techniques in physical planning. The thirteen essays comprising these two parts remain unchanged from the first edition.

Part III on the teaching of geography, however, has been revised and includes two new chapters on developments in the United States. The first focuses attention on the status of geography in American high schools and rightly stresses the need to preserve a balance between integrative thinking, in which a single area is examined with a view to interpreting the nature of that region, and analytic thinking, where the pupil is confronted with a geographical problem and is led to formulate a hypothesis in solving it. The second chapter surveys undergraduate teaching in American universities, where an increasing emphasis is being placed upon the systematic aspects of the subject. It is strange that the teaching of geography in Great Britain, however, has been allowed only one chapter in this edition; the material has nevertheless been rewritten and the errors and omissions concerning undergraduate courses in British universities which appeared in the earlier edition have been corrected. The review of geography in British schools has also been brought up to date and contains references to the revision of syllabuses by some examining boards in an attempt to give model theory in reconciling the idiographic and nomothetic approaches to memorized factual information. Consideration is also given to the role of pupils an opportunity to think originally instead of relying heavily upon geography. The trends which are discussed in this volume are so fundamental to the teaching of the subject that it deserves to be read by every practising geography teacher.

DAVID J. BOARDMAN

R. F. PRICE, *Education in Communist China* (Routledge and Kegan Paul, World Education Series, 1970, pp. 308, £3)

THROUGHOUT the ages the returned traveller from China has had a tale to tell and this compendium on very recent trends in education there is no exception. The author, who taught at the Second Language Institute in Peking from 1965 to 1967, has made excellent use of his opportunities in China and has drawn a well-documented picture of educational developments right up to the Cultural Revolution. He is aware of the close connexion between education and political thinking and the importance of China's most recent history, and indeed, the personality of the Chairman in everyday life in that country. (The Chairman's name reads Mao Ze-Dong in the transcription introduced in China and used by the author; this becomes perhaps a little incongruous when employed on established usage and when we read of the Zhou, Song and Qing dynasties and places like Guangdong, Gansu and Guizhou, although the author does supply a glossary.) The book accordingly first goes into the history and philosophy of Chinese Communism and its European antecedents and then outlines the influence of this thinking on the Chinese revolution and its leaders. The author next turns to traditional Chinese thinking and quite properly discerns a strong parallel between the popular standing of Confucius and Mao. Indeed, the writer of this notice saw on the wall of a country primary school in southern China a painting of the open book of Confucius where the centre pages had been painted over not too long ago and now contained some thoughts of Mao.

The appropriate background is not confined to thought alone, it also includes a discussion of features of China's geography and demography, and describes briefly the country's economic and social life, and some of the customs, such as the various loyalties to which a good Chinese is subject, which have always filled the Western observer with awe and wonder. Only when the stage is set does Mr Price enter on the discussion of the educational system proper which he does with skill and thoroughness, even to the inclusion of pages from actual text-books and with as much evidence as seems accessible to-day from sources both within and without the country. The book concludes with an assessment of the Cultural Revolution as witnessed by Mr Price and an informed guess as to the future of education in China.

The fascination of the study of China lies in the fact that a great culture has developed over thousands of years in virtual isolation from the rest of the world (only that the Chinese would say that the rest of the world was isolated). The forcible impact of the West on that culture has therefore given rise to developments unparalleled elsewhere, and as far as education and its underlying thinking is concerned, this has formed the subject of Mr Price's book. The introductory remarks by the general editor of this

series on comparative education suggest that the author's brief was to write a text-book, and in this the author has succeeded admirably, for in addition to relevant background and thorough treatment of his subject he has supplied precise references, statistics, charts, suggestions for wide further reading and even a glossary of modern current Chinese terms. Yet, as far as the general reader is concerned the book seems to lack what Cicero described as *humanitas*, the ordinary gentle human touch. The ordinary reader might perhaps have liked to learn more about life in ancient or even pre-revolution China. For instance we are told on p. 97 that in 1922 'primary education became six years' owing to American influence; it might have been of interest to hear what primary schools were like before that date, how teaching was carried on and what the pupils themselves were thinking. There are many passages in Chinese literature which deal with school and particularly that pathetic character, the school-master who would live with a wealthy family and only go home on holiday for the Chinese New Year. But even the more modern teacher seems to have his problems as this reviewer was told by an old teacher in 1965, who listed amongst the achievements of Communism the fact that he was paid in money, rather than in catties of rice. Incidentally, the salary scales quoted on p. 224 seem rather low; a non-graduate head of a primary school claimed his monthly salary to be 109 yuan, and that of his staff correspondingly higher than those listed, but this might well be due to local variations.

It may well be that this criticism is unfair to the author. After all, *humanitas* is not an examination subject in our colleges and schools of education and a more picturesque description of life in China may well have exceeded his brief. Within his terms of reference, however, Mr Price has written an excellent and thorough account of an educational system which probably defies comparison, even within the field of comparative education.

Nevertheless, one may be justified in asking whether there are any features within the Chinese system which may have application elsewhere in countries where there have been similar problems of an illiterate rural population which has suddenly come face to face with modern technical advance. The visitor to China cannot but admire the achievements in the field of education; new schools, many with sports facilities and even swimming pools, and as the author rightly says, a fundamental programme of teacher training both residential and by correspondence. What seems to be, however, of particular importance is the compromise attempted in China between educational advance and rural needs. Whilst in most developing countries the new literate tends to turn away from the land or the occupation of his illiterate father, the Chinese are attempting to adapt education to the needs of the countryside and if Chinese sources can be believed, results seem to have been particularly spectacular at the post primary level, in the farm-study middle school and, at a higher level, the agricultural technical school. Both types combine study with practical

farm work, using rainy days and slack seasons for class work with the aim of turning out at best managers and specialists on farms and communes, or at least literate and competent farmers with a corresponding improvement in conditions and production. There can be at present little evidence regarding the ultimate success of these schools, but they do appear to form at least one acceptable solution to the problem of the workless school leaver. Indeed, there are similar experiments going on in other developing countries, but as we have said the fascination of China lies in its independent thinking, or at least the adaptation of foreign influences to its own genius, be it the ethereal Buddhist pantheon or the more mundane problem of educating its young generation to deal with the country's immediate needs. One can only hope that the criteria employed in deciding what shall be taught and who shall teach it, will be those which will prove to be to the ultimate benefit of China.

R. H. F. DALTON

M. BALLARD (ed.), *New Movements in the Study and Teaching of History* (Temple Smith, 1970, £1.90)

In going through this work one may be tempted to conclude that one is witnessing the agonized death throes of history as an identifiable subject, for this collection of essays manifests a welter of views on the nature and uses of history which should challenge, and may also disturb, the history teacher.

It is all too easy to point out that the title is a misnomer, since many of the topics dealt with—economic history (even as interpreted by Professor Mathias), local history, the use of original sources—can hardly be considered any longer as new movements. More damaging is the comment that some of the contributors, attempting to combine an outline of recent developments in academic study with a consideration of the implications for the practising teacher, are unable to deal with both effectively. Professor McNeill, for example, provides an interesting study of the movement towards a global viewpoint in historical study, but neither develops the case for the teaching of world history, nor analyses fully how it might be, or is being treated in schools.

Some of the essayists advance contentious ideas. C. L. Hannam suggests that race prejudice 'is of relatively recent origin', and supports this with some odd evidence, including the fact that Alexander the Great married two Persian princesses (p. 27). He, too, has insufficient space to develop usefully the consequences of his argument for the teacher, and many will find his conclusion that 'we must try to learn how we can teach objectivity in schools' rather unhelpful. Professor Hoover's view, that

black history can be a valuable field of independent enquiry, which may have useful applications in school, savours rather of forcing the past to fit the present. Perhaps most startling are some of the ramifications of Professor Darlington's plea for a closer linking of history and biology. Can we really believe that 'the great persons and great events of history are connected with the transitions from . . . inbreeding to outbreeding' (alas! he offers no examples), or that inequality and injustice are naturally generated as a result of outbreeding (p. 152)?

However, several contributions stand out. Hallam's article offers a clear statement of his important research on concept development. C. C. Bayne-Jardine gives an account of some lively approaches which are being adopted in one secondary school, and Professor Elton's challenging essay (although I do not agree with all he says) will force the history teacher to think very carefully about his aims and syllabus content.

This collection is intended for researchers and school teachers, who will welcome the variety of ideas put forward. In my opinion, however, it falls halfway between being an effective practical handbook, and a rigorous study of the problems which beset history today.

R. A. LOWE

RONALD GULLIFORD, *Special Educational Needs* (Routledge and Kegan Paul, £2)

Discussing emotional difficulties, Mr. Gulliford states that 'what is needed is empathy not sympathy—empathy is the perception or understanding of what it is like to be in someone else's situation rather than a gush of sympathy.' This is wise advice to all teachers of handicapped and deprived children, and, although it is only put into words in Chapter 3, it is the underlying theme of the whole book. This, therefore, is a compassionate work written by someone who has a great deal of valuable advice to give.

In general, the advice is of two kinds. First, there is advice about how to help handicapped children, socially, emotionally and intellectually. This, of course, is a huge field even when related to only one kind of handicap, but when all the handicaps, in addition to deprived, delinquent and immigrant children, are covered, the task is immense. There are, therefore, occasions when one feels that possibly too much is being attempted, and that the treatment of some topics is too cursory. Mr. Gulliford is, of course, aware of this: 'The following outline cannot be more than a starting point', (p. 30), 'Each of the above headings is, of course, a subject in itself', (p. 33) or, discussing the work of Redl, an American psychiatrist who worked very closely with disturbed adolescents,

'The following summary cannot do justice to his account; his full discussion of each tactic is well worth reading' (p. 56). But here, of course, lies the justification for this straightforward, succinct approach; Mr. Gulliford constantly gives references and suggestions for further reading. Moreover, there is an incentive to read when one learns of the finding by Miller that severely handicapped children have less serious adjustment problems than the slightly handicapped, possibly because of the difficulty which parents have in accepting the mild handicap so that too much is expected of the child. Equally interesting is Wright's assertion that dependence and independence are not opposites, and that in addition to learning to be independent, handicapped young people need to learn how to be dependent, to be able to rely on others and to ask for and accept help.

The second kind of advice is about the organisation of special education. Included here is an illuminating section on the difference between special, remedial and compensatory education and a sensible discussion of the recurring question of whether there should be special schools or special classes. The answer, of course, as Mr. Gulliford points out, is both. There is also a welcome emphasis on the distinction between the categorisation of special needs and the categorisation of children and, allied to this, on the recognition that there is a considerable overlap in the characteristics and needs of children with different handicaps.

In the Preface it is stated that the aim of the book 'is to provide teachers . . . with a foundation of information and ideas about children with special educational needs'. The aim has been admirably fulfilled.

D. G. PRITCHARD

EDWARDS, A. D., *The Changing Sixth Form in the Twentieth Century* (Routledge and Kegan Paul, 18s. (cloth), 9s. (paper))

ALTHOUGH the sixth form has so often been claimed as one of the brighter ornaments of our educational system, surprisingly little has been written about it. It is pleasant, therefore, to be able to welcome and recommend Mr Edwards' competent research and well written essay, the interest of which lies not only in its informational content but also in the perspective which it brings to current controversies over the future nature and content of upper secondary education.

Some regret may be felt that the author was not allowed a wider compass in which to develop his themes. Apart from the obligatory genuflection in the direction of Thomas Arnold, his story begins with the Bryce Report of 1895, by which time many crucial ideological battles had already been won and lost; also some important issues in the present century, such as the role of Robert Morant in the early development of the secondary school curriculum after the 1902 Act, have had to be passed over.

Nevertheless sufficient historical background is sketched in to give a sense of depth to Mr Edwards' commendably dispassionate review of the sixth-form situation to-day. Briefly, but succinctly, he puts the question of the pool of ability in a properly objective perspective, draws attention to the disparity—too often overlooked—between the levels of education reached by boys and girls, traces the complex influences exerted by the universities on the curriculum of the sixth form, studies trends in curriculum content and looks at recent developments in educational organisation such as the appearance of sixth-form and junior colleges.

There is a short but useful bibliography which includes items published up to 1968. An unfortunate omission from this is Dr Wall's *Adolescents in School and Society* which contains a valuable account of the present state of knowledge about the educational and social needs of pupils in the upper secondary school. With the arrival of Mr Edward's volume to complement this earlier work, the student of sixth form education now has ready access to an excellent introduction to the subject.

W. A. REID

D. B. HEATER, (ed.), *The Teaching of Politics* (Methuen, 1969, 213 pp., hardbound £1.90, paperback 0.95).

THIS book is concerned with politics as a school subject—a growing one, even if the direction of the growth has not been steady nor its rate spectacular. Indeed, the publication of the present volume coincided with the formation of the Politics Association to promote and watch over the process.

Apart from Professor Crick's incisive programmatic piece, the Editor's somewhat credulous survey of teacher training, and an eclectic bibliography, the contributions by various hands fall into two groups: six of them should be of value to practitioners, since they discuss existing or hoped-for approaches to the subject at various levels, and some of the difficulties inherent in them, e.g. Donald Thompson's consideration of 'The Teaching of Civics and British Constitution'. For the more detached student, and in the long run important for the practitioner, too, there are two substantial contributions by William Gardner of the University of Minnesota and by Harold Entwistle of Manchester University. The former provides a well-organised and lucid conspectus of American empirical researches of the 1960's relevant to his theme of 'Political Socialisation' and points to the paucity of British materials (presumably the 1968 paper by McQuail, O'Sullivan and Quine on 'Elite Education and Political Values' in *Political Studies* appeared too late to be noticed by any of the contributors); the influence of the family as well as of the school—both directly through the curriculum and indirectly through its organisation and 'the pervading social atmosphere'—are usefully commented upon. Entwistle draws upon

Piaget's and particularly Bruner's educational psychology to arrive at optimistic conclusions regarding the feasibility of teaching politics in schools, though 'a concept of politics is required which locates it within the experience of the child', and goes on to suggest some appropriate lines for research.

All in all, here is a useful pioneering volume, and the present reviewer's natural inclination is simply to congratulate the Editor and wish him success in his efforts. Nonetheless even pioneers, especially of a subject so closely associated with history, should show more awareness of their antecedents: e.g. of the article by C. R. Cruttwell in *History*, 1929, or the views of the Council for Curriculum Reform in *The Content of Education*, 1945; or of the numerous relevant writings by historians from G. M. Trevelyan in the 1920's to E. H. Dance in the 1960's (and a few by economists), ignored in Brenda Cohen's contribution on 'The Problem of Bias' which is exclusively philosophical. On the other hand, the hortatory tone of much of the volume seems quite excusable, even if the Editor's bald insistence that: 'the teaching of Politics at the school level is . . . the most difficult, challenging and vital task for the profession to undertake' may not help his cause. Nevertheless, as the trends to raise school-leaving age and to lower the age of enfranchisement combine to bring the two to meet, the case for politics as a school subject cannot but gain strength. It is, therefore, of importance that the double question of whether it should, and how best it can, be taught in secondary education, should receive adequate attention.

R. SZRETER

HAROLD ENTWISTLE, *Child-centred Education* (Methuen & Co Ltd. 1970, £1.80)

ALEC A. WILLIAMS, *Basic Subjects for the Slow Learner* (Methuen Educational Ltd. 1970, £1.40)

A considerable weight of critical disapproval, some justifiable, has recently been levelled at the creed of child-centred education. Dr. Entwistle examines the implications of the term, strips away those too facile interpretations which give rise to doubt and presents a persuasive case for education which he designates 'learner-centred'. The text is '—an attempt to escape from some of the unreal either-or dilemmas into which both child-centred theorists and their critics often want to force us.' The route planned is a conducted tour through a rocky landscape viewed in fair safety from the confines of philosophical encapsulation. Beginning with admirable expository chapters in which are examined authoritative statements on such issues as the justification of Individual Education and the validity of that concept in the wider context of society, Utilitarian Educa-

tion and the rights of children as people, the author continues with a warning that 'It is necessary to distinguish between normative and technical educational prescriptions. On the one hand child-centred educationists inherit a collection of moral aphorisms about childhood; on the other there are propositions about learning and child development whose justification depends upon empirical evidence'. It is therefore slightly disappointing to find the book restricted to classroom learning and yet containing only minor attempts at synthesis with that body of empirical psychology. This reluctance to adulterate philosophy produces some interesting situations. In the chapter *Child-centred Education in Theory and Practice* we find the admission '—knowledge and skills for survival in the industrial slum are unlikely to be those communicated by the school but, rather, those picked up from life itself.' And in a surprisingly dogmatic chapter on teacher training we are assured that to teach children-not-subjects effectively, teachers need to be more highly subject qualified; yet in the same chapter we are advised that academic psychologists are unsuited by training or inclination to offer to student teachers what is better supplied by 'subject lecturers prepared to acquire the necessary psychological training.' This attitude is reflected throughout the rest of the book in which the favoured education is described in terms of R. S. Peter's 'cognitive overspill' and A. N. Whitehead's cyclical model of 'romance, precision and generalisation'. By that device is the intrusion of psychological empiricism evaded and the emphasis on value judgements retained.

The author claims to be fashioning tools with which a practitioner might analyse his practice: to the extent that practice may be evaluated in accordance with integrity of motive, the tools are keen.

Basic Subjects for the Slow Learner is a book of uncompromising Utilitarian Education. Implicit in Mr. Williams' manual is the need to recognise on behalf of slow learning children, the social imperatives of an empirically determined range of skills. His book opens with a brief discussion of the customary methods of assessment of children with learning deficits. Reference is then made to cultural deprivation and language poverty as introduction to the first of a series of down-to-desk prescriptions. Much good advice on the choice of reading schemes and the use of reading attainment tests is given in a cheerful anecdotal style and a workable system of spelling instruction is described. Like other systems in the book this one is fairly called a programme, but one may look in vain for any resemblance to what has become recognised as Programmed Learning for no built-in control mechanisms have been attempted. An unexceptional chapter on English completes the first part of the book. The second part, which deals with Mathematics, is introduced without recourse to case-book illustrations and the author gently demands a little from his readers. He distinguishes between 'number', arithmetic and mathematics, he defines 'concept' and quotes Dienes, but the chapter is tantalizingly short

and readers are shepherded back to the security of sensible prescriptions for teachers of arithmetic as a social skill. A digression on Number Readiness is followed by a neat assembly of play activities developed from Piagetian theory. Modified versions of these are collected in an appendix as a test of readiness for formal number instruction. Later stages of arithmetic are less precisely delineated and teachers are encouraged to adapt to individual circumstances.

We may assume the book to be intended for newly qualified teachers and be grateful that so practical a manual has been made available; but we may also deplore a state of teacher training which makes it necessary and regret that Mr. Williams has found it expedient to cajole where he might have challenged a more confident readership.

R. R. WHITE

JOHN BLACKIE, *Inspecting and the Inspectorate* (Routledge & Kegan Paul, 1970 £1.25)

INTENDED for students and young teachers, this book will give them a clear idea of the past and present function of Her Majesty's Inspectors, with a glance towards their future.

John Blackie, who retired in 1966 as Senior Chief Inspector after thirty-three years' service, comes to the crux in his Preface: 'It is sometimes asked whether the very existence of a school inspectorate, quite apart from its function, is not an affront to the teaching profession'. In this book, he charts the delicate relations between inspectors and teachers, from the establishment of the Inspectorate in 1839, through the blighted years of Payment by Results to the abandoning of General Inspections, the comradeship of the Schools Council and the inquisition into the Inspectorate by the Select Committee (1968).

The book is charged with a sense of dedication. Contemporary members are described as 'The nicest body of people in the world, distinguished by integrity, manners, judgement and humility' and Lowe is credited with diabolical ingenuity in curbing their forebears' influence and independence by making them responsible for linking teachers' pay to their effectiveness in teaching easily examinable skills. It has taken too long for the Inspectorate to return, in the eyes of teachers, to the ideals set for it by Dr. Kay (later, Sir James Kay-Shuttleworth) in 1840: '—it is of the utmost consequence that you should bear in mind that this inspection is not intended as a means of exercising control, but of affording assistance; that it is not to be regarded as operating for the restraint of local efforts, but for their encouragement; and that its chief objects will not be attained without the co-operation of the school committees.' The ritual of the Full Inspection, introduced in 1904 to establish standards in the new Secondary

Schools, restored the fear and awe of Inspectors felt by teachers during the thirty-six years of Payment by Results; not until they assumed the modern relationship, more supportive than inquisitorial, could the Inspectors return to Kay's model.

Yet there is a wistful nostalgia evident in Mr. Blackie's looking back. Until 1926, Her Majesty's Inspectors were the last survivors of those Senior Civil Servants who were nominated by Sponsors and there is a kind of regret in his turning to the evolution of the modern Inspectorate, subject to a rigorous procedure of selection and probation.

The Report of the Select Committee of 1968 describes their channels of communication as 'primitive', recommends that provision should be made for them to refresh their teaching experience during their service, suggests the appointment of some inspectors 'with special knowledge of social developments affecting education' and proposes that they might profitably co-operate more closely with teams of teachers, inspectors and advisers employed by Local Education Authorities. In his handling of these implied criticisms, Mr. Blackie does less than justice either to his former colleagues or to the function of Local Authority Inspectors and Advisers in complementing Her Majesty's Inspectors in these aspects of the work. He says nothing of the patient and detailed support given by H.M.I's to teachers exercising a new kind of professional responsibility in devising and launching the Certificate of Secondary Education. Little credit goes to the Local Inspectors, who have begun to use their close contact with the teachers' employers in new ways, channelling support and encouragement where it is needed, working with teachers and researchers in the practical expression of changing educational concepts through Teachers' Centres and development groups.

For Mr. Blackie, the inviolate features of the Inspectorate are its integrity and its independence. Whatever the future pattern of educational administration in this country, there will still be a need for objective and fearless examination of its aims, means and achievements. Her Majesty's Inspectors still enjoy authority based on a considerable prestige, even when one realises that they owe their distinguished name to an administrative stratagem and that they are aware of tensions (however creative) with their administrative colleagues at the Department of Education and Science. It may be that recognition of their problems and peculiar virtues, so ably put into perspective by Mr. Blackie's book, will enable teachers to work with Inspectors in a new way, certainly acceptable to Dr. Kay and, from the tone of his book, to Mr. Blackie himself.

FRANK SHERWOOD



EDUCATIONAL REVIEW

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SCHOOL OF EDUCATION
UNIVERSITY OF BIRMINGHAM

EDUCATIONAL REVIEW

Edited by

E. A. PEEL

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W. CURR

Volume 24, No. 2

February 1972

Announcing

The Quality of Understanding in Secondary School Subjects

Edited by E. A. PEEL

Very little work has been done on the nature of the thinking required of adolescents in their secondary school subjects. E. A. Peel's recent book from Staples, *The Nature of Adolescent Judgment*, is a pioneer in the field, and this collection of papers, *The Quality of Understanding*, from *Educational Review*, is an essential complement to it. In it he and his co-workers write on the research they have conducted into thinking in such subjects as mathematics, geography, history, science, etc., and into thinking abilities in relation to the curriculum in general. Professor Peel edits the collection, and writes the introductory paper.

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EDUCATIONAL REVIEW

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SCHOOL OF EDUCATION
UNIVERSITY OF BIRMINGHAM

THE STUDY OF EDUCATIONAL THEORY IN RELATION TO TEACHER TRAINING*

by J. W. TIBBLE

Emeritus Professor, University of Leicester

I. INTRODUCTION

I BEGIN with an assumption about the function of a College of Education: that it has two main purposes today and that they are equally legitimate. One purpose is to provide for its students a good general education at the higher level, a purpose it shares with all the other institutions providing higher education today, universities, polytechnics and technical colleges. Some of these institutions, e.g. the older universities, have had this function for many centuries; others including the colleges of education have gradually evolved to this stage from institutions providing specific vocational training at a lower level. What the teacher training colleges of the nineteenth century provided was in effect general secondary education with very specific training in class management and lesson presentation. It was the implementation of the 1902 Education Act which set them free to develop higher forms of academic work and gradually to build in a 'study' ingredient to the professional training. Unfortunately this historic development created something of a dichotomy in the college curriculum, embodied in the terms Main or Special subjects on the one hand and Professional courses, including Education and Curriculum courses, on the other; the former being studied for the students' personal and cultural benefit, the latter for their equipment as teachers. This was the official doctrine in the period following the second world war but as you are well aware, its validity is now being questioned and from both sides of the fence, so to speak. The main reasons for the questioning are that it does assume a fence, a too rigorous division in the work of the college between the purpose I have referred to, of providing a form of higher education, and the second purpose of preparing students for a specific profession. As I

* Paper given at the summer conference for Lecturers in Education organised by the Birmingham University School of Education at Summerfield College, 1971

have said both these purposes are legitimate. What I am questioning is the particular form of curricular organization which evolved to implement them. This tends to divide the work of the colleges too sharply into different compartments, one concerned mainly with the one objective, the general higher education and the other with the professional preparation. I accept the need for some differentiation but I am assuming that the more closely the two purposes can be related in all aspects of the college's work, the more effective the learning will be.

The point I am leading up to is that the study of education should be as much a contribution to the general higher education of the student, to his development as a human being as it is to his professional competence. Surely teaching is an occupation in which a close relationship between these two is most desirable. We want, all would agree, not just teachers who can manage groups of children and induce them to learn this and that; we want teachers who are themselves good advertisements for education, who go on learning themselves at the highest level of which they are capable. So I want first to consider the study of education as a contribution to higher education.

2. 'EDUCATION' AS HIGHER EDUCATION

It is of course in this sense, a very recent subject of study. Some philosophers and educators down the ages have thought about the nature of education and R. H. Quick's *Essays on Educational Reformers* (1868) was a pioneer work which, toward the end of the nineteenth century, stimulated study and research in the history of educational thought and practice. But there was little else at that time to provide a foundation for a theory or 'science' of education. The existing traditions of schooling, both of the older grammar school and the nineteenth century elementary school were largely alien to this. As Dr Andrew Bell, a pioneer of teacher training, put it, 'It is by attending the school, seeing what is going on there, and taking a share in the office of tuition, that teachers are to be formed, and not by lectures and abstract instructions. (Some of the current criticisms of our work suggest that Andrew Bell still has ardent disciples.) A century later we find C. H. Judd (1914) commenting on the emphasis on practical education in English training colleges and the relative neglect of education theory which was given a very meagre and abstract treatment. As for study of education at a higher level, we find Professor Meiklejohn of St Andrews at an International Conference of Educa-

on in 1884 commenting, 'There is, in the three kingdoms, no one man who gives the whole of his time to observing and to thinking about the educational processes which are going on in schools every day.' Medicine had its hundreds of professors who not only furthered medical research but taught and trained practitioners of medicine. By contrast, 'There is, in no University in England, a single person whose duty is to guide a teacher in his daily practice. So far as the English Universities are concerned, education is still in its amateur and empiric stage. Hence much friction, great waste of mental power, great waste of time, and disappointing results.' As he saw it the three ingredients of the needed study were the history of education including comparative education, examination of the growth and development of different kinds of young minds, and the study of method which, he thought, should be heuristic in all subjects, not just in science. Under this last heading he referred to the deadly dominance of routine in classrooms which 'gives rise to mental diseases, which infect to a greater or smaller extent almost every classroom in the country.'

Thus Meiklejohn gives us three of the ingredients for a possible study of education: educational psychology, history of education, and method by which he clearly meant not 'tricks of the trade' but what we should call today curriculum theory and practice. These three figure in some form or other in the Education courses which developed in the colleges in the period between the two wars when Masters of Method gave way to Lecturers in Education. L. G. E. Jones writing in 1924 noted the development of a more scientific type of training based on the study of psychology but he did add that few colleges had the conditions essential for success. 'The work demands lecturers of high qualifications and long and varied experience, as well as students with mature and trained minds and leisure for sustained thought.' It was not until the next phase, following World War 2 that advanced diploma and higher degree courses in Education began to make a significant contribution to the problem of adequately trained staff; and not until the 1960s that the institution of the 3 year course relaxed somewhat the intense pressures on students. But by this time two other ingredients of the study of education had appeared on the scene and were in process of establishing themselves. One of these was the Sociology of Education, a by-product of the rapid expansion of Sociology in the Universities during this period. This linked up with an increasing emphasis on the social aspects of

Education in the College courses over the same period. The other newcomer, philosophy of education (i.e. modern analytic philosophy, not the older 'great educators' approach) made a double contribution in the 1960s. It not only provided yet another branch of study, it also instigated, for the first time, thought about the nature and structure of Education as a subject of study.

3. THE NATURE OF THE SUBJECT

I have to say at this point that another of my assumptions is that the analysis of Professors Peters and Hirst of the nature of the subject is valid. I accept that it is a field of study, not a basic discipline and therefore, like Geography, makes use of a variety of disciplines to explore educational topics. The '4 disciplines' approach is now widely accepted though not welcomed by all. There is not yet an adequate supply of qualified staff in all the disciplines, particularly the newest; but most colleges do what they can to give students some grounding in the contributory disciplines, in some cases offering psychology and sociology (as well as history) as Main Course subjects. I am sure myself that this development was necessary for the acceptance (as has happened) of Education as a proper university study at all levels from undergraduate to higher degree. But it does face us with another problem and this, I suggest, is what has to be tackled in the next phase of our development. There is a danger that the various disciplines, once established, will succumb to the tendencies to compartmentalize or departmentalize the curriculum which are so obvious elsewhere in the system—i.e. in the secondary and higher stages of it. Can we find ways of relating more closely the basic disciplines in the field of Education without losing the benefits of more specialized study? If we can, we should; because the aim of these Education courses at the level we are considering is certainly not to produce specialists in educational psychology or sociology or history or philosophy. That may well be a legitimate aim of courses at a higher level—advanced diploma and higher degree courses. But at the certificate and I would think also the BEd level, the aim of studying the various disciplines is for the light they throw on a range of educational topics and problems which are relevant to the students in terms of their own experience and needs.

This is not, I think, an insoluble problem but it may well be a

difficult one because it is new and the techniques for doing it are not yet worked out and validated. It may also be difficult because it does involve a team teaching approach by members of staff who are specialists in different fields of study, skilled in pursuing their own specialisms and indeed encouraged to do this rather than to relate what they are doing to the work of specialists in other fields. What is needed here is that the Education staff as a team should not only cooperate in selecting a range of relevant topics on which each of the disciplines can throw some light. It is essential, in my view, that the cooperation should extend to the treatment of the topics so that the students experience the relating process in the learning situation. They cannot be left to do this for themselves in the first place though eventually, we should hope, they will become capable of doing this: but only if their teachers show themselves capable of doing it. In this, as in other matters we should try to practise what we are preaching.

I do not propose to give examples of the topics which might be chosen to make up the syllabus in Education because as I have said the choice should be worked out by a team of staff representing the different disciplines and aspects, preferably those who are going to administer and teach as well as plan the course. There is, I suggest, no general ideal selection of topics; there is a best one for this particular group of staff in this college. I would also be in favour of involving students in the selection too as soon as they have had enough experience of the course to appreciate the aims. But in any case it is vitally important (more on this later) to go to some pains to explain to students what is involved and what is the purpose of the study. We do not do enough of this, in my view.

As to the implications for the methods to be used in organising and presenting the course, team teaching is a 'must' either through several members of staff preparing the materials to be made available for a given topic or through a seminar or panel presentation with several members of staff operating together—the group of students in the audience can be quite large provided there is also a follow up in small discussion groups. Or of course both these methods can be used in conjunction. These techniques assume a high degree of flexibility in the staff taking part and probably some modification of existing attitudes. While making their contribution as experts in a given field, they must be prepared to function in areas outside their expertise, as group leaders or merely as participants.

4. 'EDUCATION' AND PRACTICE

I turn now to the second main purpose of our work and consider the study of education in relation to professional work and the practice of teaching. One of the commonest grounds of the criticism teacher education tends to be bombarded with is the alleged lack of relevance between theory and practice: especially by students but also by practising teachers. 'Forget all that cloudy theory; now you are at the coal face and it won't help you.' Something like this may well be heard by the entrant to the profession from older colleagues. As for the student himself, for many, learning what is involved in becoming an efficient teacher can be a painful, at times a humiliating, business. He naturally feels, when class control is in doubt or when children obviously haven't understood or remembered what he taught them yesterday, 'Why didn't they *help* me more, why don't they show me how to do this. Can they in fact do it themselves?' Now we, i.e. the college tutors, are not to blame because we *haven't* done this, because in fact for many of the tasks and skills in question it cannot be done: not in the 'tell me or show me how' way the student wants it. *We* know many things can only be learned rather slowly and painfully, the hard way, by experience over perhaps a considerable period of time, longer than the course and in fact under conditions of fuller responsibility than the course can provide. I am often conscious as an examiner when agreeing that a student's mark should be say B+ or A- for practical teaching, 'But are we sure, do we know that he or she has *really* been tested in class control?' Whereas the poor wretch we are giving a D to may have been tested by conditions beyond what all but a few students could be expected to cope with at their stage of experience.

We are *not* to blame for not giving the solutions to these problems in 5 easy lessons. But we are perhaps to blame for not making clear to students the different nature of the practical tasks facing them, and the different kinds of theory that exist and where one can be related to the other and where not, or not immediately. Maybe we don't do enough of this because we are not clear enough ourselves about it. *We* find it rewarding to study theory anyway. Maybe we can see applications which the student cannot because he or she has not had enough experience to see the point. But if we are quite frank we would probably agree that a particular bit of educational study has *no* direct and immediate application in the classroom, even for us. Its

application is longer term and indirect, e.g. by the way it changes our understanding of the educational process as a whole and our attitudes to the job and the kind of people we are. This is in the long run as *practical* an aim as skills in the classroom: and as important. We *want* teachers to think about what they do, question all practices, be concerned with education in its wider aspects, outside their particular age range and subject, be concerned as citizens as well as teachers and *not* say 'We cannot do anything about that, bad as it is, e.g. formal examinations. The parents, employers, universities, LEAs etc. want them. We are helpless.'

We want this, even more perhaps than that they should be competent practitioners when they leave the course. But do we do all we can to sell this to the students, to educate them *re* the functions of the education course?

So I think there is no more important task facing us at the moment than working out the distinctions between longer and shorter range applications of the study of education and making clear how and when one may expect to make use of knowledge of a particular topic. Usually for any topic like, say, equality of opportunity there *are* some immediate possible applications as well as much longer range ones. We should be explicit about this. Too much teaching is shooting arrows in the air; they fall to earth we know not where.

This of course is also another criterion to bear in mind in both the selection and presentation of the topics chosen for study. It is obviously wise to preserve a balance between longer and shorter term applications and to try to give maximum help to the student with his day to day problems while convincing him that all study which does not do this is not necessarily useless. We have in fact to think much more of teacher education as a lifelong process and take as much interest in inservice as in initial education in the colleges. If we *could* plan the study of education over this longer range, it would be relevant to decide which topics or aspects should come earlier and which be left for more mature study. At present there is a compulsion to pack bits of everything into the initial course to make sure they do meet it (or maybe to convince our colleagues on Boards of Studies that we ourselves do know the field of study).

5. 'APPLICATION' IN PLANNING COURSES

My first suggestion *re* the relating of theory and practice is then

that we bring a consideration of application as an omni-present factor into the planning and conduct of the course. This is, in fact, to implement another aspect of our interpretation of the nature of the subject as we understand it today. Professor Paul Hirst has described educational theory as 'practical theory', i.e. theory where the main purpose of studying it is to throw light on, validate, bring about changes in practice. If we accept this, as I do, we should be concerned to apply it, otherwise we are contradicting in our own practice what we preach in our theory. Working this out faces all of us with some years of work ahead. But it should be exciting. And I note once again that it is not a task for people to work out for themselves in isolation. It involves groups doing it together: and in this case including people who are mainly practitioners as well as teachers with expertise in different branches of theory. The gulf, *in the profession*, between theory and practice is one of the things preventing it from being as fully a profession as most of us would like.

To turn to means whereby this relating of theory and practice may best be achieved, what I have suggested so far is that in the study part of the course application to practice should be always explicit (even where it is very long term) in the sense that we make clear what the use of the theory is in the particular case. More awareness of this would in fact perhaps have saved us from the tyranny of selection and testing in the earlier part of this century.

But I also suggest that we are at present not making enough use of one point in the course where relating theory and practice can be most fruitful and that is in the supervision of practical work. It is here that the student has experience of practice, meets problems, needs help. *If* the study of theory *can* be of help, immediate or longer term, now is a good time to make him aware of it. Unfortunately the way we do this supervision, with supervisors dashing round from pillar to post—and not necessarily the ones who consider educational theory as their concern anyway—makes it very unlikely that the opportunity will be seized.

In my view we should rethink this whole business. The 'must' is to ensure that college tutors who *are* concerned with educational theory can have tutorial periods with students (individual or small group) *during* block practices. As things are this is probably the one time in the course when they *don't* have tutorials, because of problems of time and place.

But if this *is* a priority, we should find means to implement it. For

example, it does not matter in my view whether the tutor, in this sense, has seen the lesson which forms the basis of the discussion. It is perhaps better if he relies on the student for the version of this because what the student is aware of is much more important for this purpose than what the supervisor would see by sitting in. After all, we are, or should be, experienced in classroom situations and can well interpret the student's version. I am not dogmatic about this: it is just that if the supervisor is going to find time for tutorials in which the specific relating of theory to practice, starting with practice, can be done, he or she *cannot* also spend all that time travelling between schools and sitting in classrooms. But, you will say, the student does need someone there to give day to day help and support (much more in fact than the college tutor's two visits a week). I agree and the person best placed to do that is someone in the school, a teacher tutor—someone I agree chosen by the college, understanding what the college is trying to do, sympathetic with students, and with the college tutors to consult over problems. Not all teachers can or want to take this extra responsibility but I do think we should give them it where we can. And so gain the time for the education tutors (and maybe others) to make their distinctive contribution in helping to relate theory and practice, starting from the practice end. You may want to say this is what you do at present. I doubt it. Would you be prepared to do a survey which would compare the actual time spent talking with the student (which is when the relating can be done) with the time spent observing and the time spent in travel? What I am proposing then is to make the college tutors' supervisory role and that of selected teachers complementary, not overlapping (and at times in conflict).

In conclusion, I am well aware that this revision of methods of supervision is no easy task. I accept the existence of all the problems and difficulties that are brought forward as objections to any change here. But I *do* say, it is a question of priorities; and if the closer relating of theory and practice is a priority, as I believe it now is, we shall in fact find ways of solving or diminishing the problems to enable us to concentrate on this priority. After all it would not lessen a student's chances of learning a good deal from the experience of being in a school and a classroom, as R. H. Quick said, and it might well help to make this learning more effective, at any rate more enlightened with greater chance of the student going on learning for the rest of his or her career.

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NOTICEABILITY OF COLOURS

by LESLIE BRADFORD

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I. INTRODUCTION

IN recent years a number of Reading Schemes and other Teaching Aids have been produced in which considerable use has been made of Colour as an integral part of the instructional materials.

Certain of these schemes are entirely in colour while others use colour for emphasis or to direct the pupil's attention to particular items.

This investigation was carried out in order to attempt a quantification of the relationship between specific hues (colours) and their noticeability. Noticeability, in this context, is the extent to which a particular coloured item is noticed and recalled, when it is exposed, together with other items differently coloured.

A preliminary enquiry, using a standardised Reading Test was carried out. In this, a small sample of Primary and of Secondary school pupils were given copies of the Holborn Reading Test to read through. The Test was reproduced on 6 identical cards each printed in a different colour. The colours were arbitrarily chosen.

Subjects were asked to read through the test 6 times in succession thereby being exposed to it in 6 colours. The cards were produced in random order for each subject. No comment was made as to success or failure and the scores for each subject noted.

It was found that 31 of the subjects had a 'best' score when the Test Card was printed in Red and this irrespective of the position of the Red card in the sequence. No serious attempt was made to quantify these results. They did suggest that a more serious investigation into colour noticeability might prove interesting.

2. HYPOTHESIS

That when a series of stimulus cards, each presenting randomly selected upper case letters randomly distributed on successive cards but with each of nine colours always represented on each card and these colours randomly positioned and distributed: there will be no

significant differences in the frequencies with which items of particular colours are recalled.

3. APPARATUS

A 3 sided 'box' was constructed, having walls 2 feet square. The inside of the 'box' was painted matt black. In the back wall of the box was a shutter, opened manually and closed by a spring and weight mechanism. The shutter was so timed that it closed 1 second after opening.

The aperture, situated centrally in the back wall of the box allowed exposure of stimulus cards for the relevant time-span. The aperture measured 6" by 5".

Cards cut from artist's cold-pressed matt white card had a finely drawn matrix on them. This allowed 30 possible positions for the stimulus items.

30 such cards were prepared. 5 of them had letters in black ink. 5 had all items but one in black, the final item coloured. 20 cards had all items in colour. Each item differently coloured.

The all-black-letter cards were used to determine optimum time exposure.

Cards with one coloured item were used to test odd-man-out effect.

The 20 cards with all items coloured were used in the main experiment.

4. SELECTION OF COLOURS

The main spectral colours, red, orange, yellow, green, blue and violet were used. To these were added black, brown and neutral (grey).

Consistency of colour was obtained by using printer's inks from a single source.

In the first instance a hue was chosen from a colour card representing the middle order as near as possible of each of the 6 spectral colours. Reference was made to the Angstrom Unit value of each hue and a shade representative of its middle order was chosen.

Red	...	6500 units
Orange	...	6050
Yellow	...	5740
Green	...	5200
Blue	...	4800
Violet	...	4300

Brown, black and grey were arbitrarily chosen by the investigator.

Each of the spectral colours was presented to a panel of 5 judges. Each colour was presented in 5 variations of tint and shade clustered around the middle order. Judges were asked to select from each colour cluster that which in their opinions represented the ideal 'redness', 'blueness' and etc.

The following hues denoted by the appropriate Ostwald coding were used in the investigation.

Red ...	...	Ostwald red 7/8
Orange	...	„ orange 5/0
Yellow	...	„ yellow 1/0
Green	...	„ green 21/22
Blue ...	...	„ blue 13/14
Violet	...	„ purple 10

5. EXPOSURE TIME

To establish an optimum exposure of each card a pilot study was carried out in schools other than those earmarked for the main enquiry.

The all-black-letter cards were exposed to randomly selected groups of children, 10 at each age-group 7-12. The mean of items recalled at age-group and for each exposure time from 3 seconds to $\frac{1}{2}$ second gave a one-second exposure as being the most satisfactory. At this exposure time the mean number of items recalled was 2.4.

One 8-year-old girl was able to recall all 9 items on the stimulus cards at one second exposure. This suggested eidetic imagery in her case. No other child was able to do this.

6. CONSTRUCTION OF CARDS

As has been said each card had a finely drawn matrix on it. It was decided that a minimum of 9 items on each card would be sufficient to preclude pre-selection of items.

For the 20 all-colour cards firstly the positions of items on each card were randomly selected (any 9 from 30). Then a random selection of letters (any 9 from 26) was made for each card and one of the nine colours randomly allocated to each letter. All nine colours appeared on each card.

The letters were produced by stencil. All letters were upper case sans-serif letters.

7. DESIGN OF THE INVESTIGATION

The subjects of the investigation were drawn from the populations of 2 secondary and 2 primary schools. The schools were chosen at random from a list of such schools with more than 100 pupils on roll.

The schools finally chosen were paired for rural/urban location. The subjects were chosen at random from class registers.

It had been intended originally to carry out the investigation over the age range 5 to 16. In the event, however, it was found that a great many children in the lower age-brackets were not able to name letters 'at sight'. This was also true of some Secondary pupils.

It was decided, finally, to investigate the age-range 7-16. Screening was carried out for ability to name letters 'at sight', and for colour-blindness (Ishihara Test).

Children rejected by the screening were replaced by random selection.

On letter naming 23 Primary and 14 Secondary pupils were rejected. Three children were rejected on the Ishihara Test. No attempt was made to control factors of 'Intelligence' or of Socio-economic grouping. The only physical factor controlled was that of color-blindness.

The following variables were subject to control:

Exposure time

Distance from aperture

Light quality

Field of view

Consistency of Colour

Size of exposed items (all letters were $\frac{3}{4}$ " high)

8. TESTING PROCEDURE

The box was set up in an appropriate position with satisfactory light conditions. Each child was tested separately. Apart from the investigator no other person was in the room with the subject.

Since the investigator was a familiar figure in the schools selected and well-known to the children there were few problems of anxiety among subjects who all appeared to enjoy the 'game'.

Cards were placed, ready shuffled, behind the box and out of sight of the subject. Each subject was familiarised with the equipment and shown the shutter rising and falling to expose an all-black-letter card.

Each subject was told 'I shall show you some cards, which will appear in the window you have just seen open. Each card will have letters on it. You will be able to see the card for a very short time. When the shutter has dropped I want you to name any letters you remember having seen. There is no right or wrong. What you remember may not be the same as any other person. I would like to know what *you* remember.'

Each subject's responses for each card were recorded. Relevant colours were subsequently noted.

The following information was noted:

Letters recalled in the order named

Position on card of first two responses

Direction of eye-movement from 1st response to 2nd.

Adjacency or otherwise of 2nd response to 1st.

Since there was no way of determining which of the responses named was, in fact, the first to be noticed; both 1st and 2nd items were included in the final count.

9. SUMMARY AND CONCLUSIONS

The limited nature of this investigation does not allow wide inferences to be made. Nevertheless, of the 7200 responses recorded from 180 children approximately 38% were in the orange-red sector of the spectrum. The remaining responses were evenly spread over the remaining hues. Only violet came close to the red sector.

It would seem, from this enquiry, that there is a tendency for stimuli which are pigmented in the orange-red arc of the spectrum to have a high noticeability factor. This may have some relevance in Remedial Teaching where it is often necessary to have attention drawn to a particular item in a cluster.

Boys and Girls scores were correlated: $3 - 0.95$.

Responses tabulated in rank order

Red	...	1483	...	20.6%
Orange	...	1222	...	16.9%
Violet	...	744	...	10.3%
Blue	...	717	...	9.3%
Green	...	692	...	9.6%
Black	...	645	...	8.9%

Yellow	...	606	...	8.4%
Brown	...	584	...	8.2%
Neutral	...	507	...	7.2%
		7200		100.0%

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THE CHILD'S UNDERSTANDING OF CREATION

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I. INTRODUCTION

THIS article reports an investigation of the way in which some primary and grammar school children in Northern Ireland understood the meaning of the Genesis story of creation. Only a small number of children attending two schools were involved and a more thorough and broadly based study would be required to make valid generalisations. Despite these limitations, it is felt that the results are of some interest and value to teachers and parents, and also to those who are responsible for the construction of agreed syllabuses of Religious Education.

2. METHOD

The investigation began in May 1969, when a recording was made of a discussion with 12 children aged between $9\frac{1}{2}$ and $11\frac{1}{2}$ years attending a county primary school. The discussion opened with a reading of several verses from Genesis which stated that God created the heaven and the earth, that God took six days over the creation and that He rested on the seventh day. The purpose of the discussion was to discover the questions which were in the children's minds and the problems of understanding which they faced. Subsequently, a more extended series of taped discussions was arranged in June 1970, generally involving small groups of children from 6 to 17 years of age, attending a county primary school (P3-7) and a Protestant voluntary grammar school (Form 1-Lower 6). Most groups consisted of 2 boys and 2 girls of approximately the same age and in all 46 children were involved. In both schools, the children were not chosen at random, but were picked by the principal and/or the class teacher. No attempt was made to ascertain their intelligence, or to study family and church background or to relate their religious beliefs to subjects being studied (in the case of grammar school pupils). The

following brief extract from the first chapter of Genesis was played on a tape recorder to each group.

The first chapter of Genesis tells how 'In the beginning God created the heavens and the earth'. On the third day He made plants, on the fourth the sun and the moon, on the fifth birds and fish. On the sixth day He made animals and He made man, in His own image. 'And God saw everything that He had made, and behold it was very good. And there was evening and there was morning, a sixth day'. Then God rested on the seventh day from His work.

In the subsequent discussion, a number of questions were asked in as natural a way as possible. These included the following:

1. Have you heard this story before?
2. Do you find the story hard to understand?
3. Do you think God made the world just as it is described in Genesis?
4. Do you think He made the world in six days?
5. Are there any difficulties raised by this passage? Have you heard of another account of how the world was made which differs from the story in Genesis?
6. Another part of Genesis calls the first man and woman Adam and Eve. Do you find this difficult to understand?
7. Do you think Adam and Eve were real people in history, like King William or Winston Churchill or St. Patrick?

Each discussion was recorded and subsequently a script was prepared.

3. THE MEANING OF CREATION

Before discussing the results of this study, it is necessary to summarise the way in which many contemporary theologians interpret the doctrine of creation. (It is realised that this summary may be contrary to the views of some conservative scholars). The present writer is in general agreement with the beliefs of these contemporary theologians, and his interpretation of children's religious thinking rests upon this particular point of view.

(1) The scientist attempts to explain all natural phenomena, past and present, and questions about when and how the universe began, how it subsequently developed and how it now operates are within his province. The theologian, or man of religious faith, is concerned with the meaning of existence. 'The religious affirmation that God created the world is, therefore, fundamentally concerned, to give a

positive answer to the baffling mystery of the meaning of our life here and now as finite, transient creatures' (Gilkey, 1968, p. 179). In the words of another scholar, the question of creation 'is not, How did the world begin? or, Who made it? but rather, What does it mean to be a creature? or, How does it affect our understanding of ourselves and our world to believe that we and it are creations of God?' (Macquarrie, 1966, p. 195)

(2) The creation stories in Genesis 1 and 2 are, therefore, not to be interpreted as scientific accounts of the origin of the universe, and attempts to reconcile details in these chapters with the scientific theory of evolution are mistaken and unnecessary. Nor can the story of Adam and Eve in the Garden of Eden be interpreted as historical. 'Most historians are agreed that the first human beings lived at least 1,000,000 years ago. But they also tell us that human beings first used writing only about 5,000 years ago. So it does not seem that the writer of Genesis 2 could have known the answers to questions like these, e.g. whether men existed before women, or the names of the first human beings'. (Hargreaves, 1969, p. 21).

(3) The religious message of the early chapters of Genesis is conveyed through the use of myths which express a kind of truth which cannot be expressed in historical or scientific categories. It is difficult to define the word 'myth' adequately but it may be taken to be a dramatic story about the distant past, making use of evocative images, and carrying within itself a profound symbolism (Macquarrie, 1967). For twentieth century man to understand the meaning of the Genesis myths of creation requires a process of thinking, by which their message is interpreted in terms of human existence in the present day. By such a process 'the creation story . . . is brought from the beginning of time and the land of Eden into the present, as a self-understanding by which I grasp the finite, contingent and creaturely character of my own existence; the talk of God's making man is understood in terms of the giftlike character of my existence' (Macquarrie, 1967, p. 183).

4. RESULTS

A. DIFFICULTIES IN UNDERSTANDING GENESIS

It has been shown by Ronald Goldman (1964) that as children grow up, they pass through 3 recognisable stages in their thinking about religion.

- (1) Up to the age of 7-8 years their thinking is largely intuitive; they do not have the experience nor the mental ability to think logically about religious ideas.
- (2) From 7-8 years until about the age of 13-14 years their thinking is concrete operational; logical thinking is possible within the restricted field of what can be touched and seen.
- (3) At about 13-14 years they begin to develop the capacity for abstract operational thinking, and can understand the meaning of symbolism and imagery.

Goldman has emphasised that these boundaries are not fixed and vary from child to child, and he has shown that the capacity to think abstractly about religion develops later than the capacity to think abstractly about other aspects of experience. This, he suggests, is due to the fact that religious thinking is secondary and depends on the enriching of general experience before religious language can be understood, and also to confusion in the child's mind about religious matters caused by poor or premature teaching.

It is, therefore, to be expected that primary school children and younger grammar school children would interpret the Genesis stories concretely, as stories which are literally true. This was in fact generally found to be the case in this investigation, but there was ample evidence that many of the children were dissatisfied with a literal interpretation. They, therefore, raised difficulties which arose out of an attempt to relate the creation of the universe to their own limited experience and knowledge.

Creation in 6 days

TERRY (8): I think it's just impossible . . . because it's just funny that God can make the whole world in 6 days and I can't hardly make a tree hut in 6 days. It would take me about a year.

SHEILA (11): I think God did do it but I don't think it happened in seven days. Like, that's hardly possible when you think how much there is in the whole world and everywhere. It's hardly possible it would happen in 7 days, I think it happened, say, over a period. A number of suggestions were made which gave God a longer time in which to work.

HILDA (14): It depends what you mean by days. It could mean a period of time in the Hebrew and it doesn't really say how long the time was, and it doesn't necessarily mean 24 hours. But if God has made the earth and God is what we believe He is, then He could have

done it in 24 hours. But I don't think He did. Q * I think it was a longer period of time. Q. I don't know. Hundreds of years.

CLEM (13): It might be like a different length of day . . . It could have taken longer because the earth could have been in a different place at the time. That could make the day longer or shorter as you go nearer the sun.

Adam and Eve

The story of the creation of Adam and Eve by God raised many different problems for children.

SHEILA (11): I think they probably were the first man and woman in the world but I don't think it happened just out of the dust of the earth. And it's strange that they weren't like children first. They were just put on as man and woman it seems, you know, grown up.

ALAN (11) asked: How God created Adam and Eve. How did God do it without a wife?

DONALD (8): The thing that puzzles me is how—how that God got the skin on . . . the flesh and the heart. He couldn't have took it from his own because . . . He couldn't have made the heart like in a cobbler's shop, so he must have put some of His heart into it.

MAUREEN (8): I can't think how if God took a rib from Adam how Adam did without it.

MOORE (10): There must be an explanation for everything. God can't just make something appear and it just comes up in a puff of smoke. Other children were puzzled to know where Adam and Eve's son got his wife from.

MAUD (11): Adam and Eve bore two sons, then it said, I think it was Cain, he killed his brother Abel and he went off to find . . . he found another woman, but who got, who bore that woman? Q. Yes where did he get his wife?

Several grammar school children put forward the suggestion that the human race would be insane if Cain in fact married his sister, since inbreeding can sometimes lead to mental and physical abnormality.

WALTER (17): Well to-day it is impossible for a whole human race to be created from two people. Q. If the son married the daughter the children would be imbeciles, or if the son married the mother, they would be imbeciles as well.

The relationship of Adam and Eve to stone age men also raised some questions.

* Q. = a question asked to help the child clarify her thinking

ALAN (11): Which came first, Adam and Eve or the Stone Age men? Later he commented: It may have been Adam and Eve that started the Stone Age men.

HANNA (9): If Adam and Eve were just made there, how were the Stone Age people made?

The Creation of the Universe.

In addition to the creation in six days, other questions were raised by pupils in both primary and grammar schools.

MOORE (10): If God made the world how did He fit in all those chemicals and all the uranium. Where did He get all those from if we can't get them?

DONALD (8): It's amazing how God made the sea—you know, because where did He get the water from to make the sea?

MAUD (11): It says in a picture Bible story book of mine that Adam had to give names to all the animals and things in the world that God created and He seemed to create so much that how could Adam give names to all the things? Q. How could he travel all over the world like from here . . . people have just discovered things?

Other pupils raised questions relating to the precise order of creation in Genesis, and the source of the writer's information.

IVAN (10): It says in the bible here that God made the earth in a day, but then there was no days. They had to make light before there was days and nights.

PADDY (17): He does say that the sun was created after the earth and plants grow from the sun. Everything grows from the sun. The sun is a vital necessity of life. You'd all agree everything grows up towards the sun including human beings. You couldn't possibly have plants and all growing on the earth before the sun came along.

MACK (12) The people who wrote the bible about a couple of centuries ago, how on earth could they know exactly how, where could they have got the information about how God had made the earth . . .? I think they wouldn't have been there to know what exact day what was made.

B. THE PROBLEM OF THE TWO WORLDS

Goldman (1964, p. 235) has drawn attention to the fact that from nine to thirteen years 'a dualistic way of looking at God's activity in the natural world begins, one theological and one scientific. He (the

child) holds strongly to many of his infantile ideas in thinking of God intervening in the world in an arbitrary fashion, but his growing awareness of scientific matters begins to create a divergence in thinking'. Goldman (1964, p. 242) says he has 'evidence to support the view that at some period many adolescents jettison their theological framework as childish, and because it cannot apparently be reconciled with science, and it is one hypothesis which seems to account for the loss of many pupils to the Christian faith.'

In this investigation, it was found that all the pupils except two 6 year olds had heard the Genesis story, often from a number of sources; parents, T.V., day school, Sunday school, Church, bible. From 8 years of age, some knowledge of the scientific origin of the universe and of life on the universe was common, and this also came from a number of sources; parents, science, history, geography, National Geographical magazine and books. This scientific understanding was often expressed in crude and confused ways, but it was a definite part of the world of ideas of children from the upper primary school and grammar school.

MAUREEN (8): Could He just make the sun just like that? And how, could *He* just make the earth? There's a scientific reason that it was part of the sun once and how come *He* made it?

DONALD (8): Well, I heard the story about the sun when my dad told me about it one day. And he said that there were two suns and one was stronger than the other sun which we've got now . . . And it was so much that it burnt a little bit of the sun and . . . The molten lava zoomed down and then . . . as it were going so fast . . . a piece broke off it. And . . . that created the moon. And eventually it stopped and the molten lava cooled down and that's how the earth was created and the moon. And the moon was made of the same mixture as the earth . . . So that said He made the earth but my Dad told me that story the earth was made from the sun.

MOORE (10): I read this book about science at home that tells us that we came from these wee creatures that lived in the sea up until we formed man. I think that these wee things grew of the molecules of the sea. We broke off from the sun and cooled down and there was a whole lot of water vapour on the earth and that formed the sea and these wee creatures formed out of the sea and so on until it came up to humans.

Faced with two possible explanations of the origin of the earth, it

is understandable why children have difficulty in accepting the biblical story as a description of actual events.

CLARE (10): I don't really know what to think because in some books, like Moore said, you know, it says we were formed from sea creatures and then you know you don't really—. If you're a Christian you have to believe in the bible but I don't know what to think.

KATHLEEN (13): I think the bible is true on the whole. I would like to know which is right, the scientists' theory or the bible.

Some pupils expressed doubt about the adequacy of the evidence for the theory of evolution and were uncertain about the scientific method of studying the history of the world.

PATRICK (13): I believe in the bible more than that because I don't see how the scientists could know what happened because they weren't there. Nobody was there. But people who wrote the bible wrote about it because God told them what happened, how it was made. The scientists weren't there.

CLEM (13): I just don't know, because there haven't been enough really fact of evolution yet.

ANGELA (14): I think that everybody just accepts that evolution is correct and nobody really knows—it can't be proved definitely.

A number of pupils clearly rejected the biblical account of creation.

PERRY (11): If you read some books on astronomy say, you'll see that there is no room for anything like heaven or God as such. . . . I think it's a nice way of putting it, but I don't really think it's how it happened. I don't really believe it. I think it's just their way of explaining things.

When asked how she could reconcile the account of the origin of the earth which she had been taught in history with the Genesis story,

CELIA (12) said: "Well, either one of them's wrong." To which

MACK (12) added: "I would say history rather than the bible might be correct in more ways."

TREVOR (11): I think most of the Genesis was made up by the people of that time. . . . They started to write it and they couldn't do without an explanation, a good explanation for what did happen, so they just, you know, sort of mystified it, just imagined it appeared. Q. They sort of made it up because they had no explanation, but now I think that different scientific explanations have been found with evidence . . . attached to them.

Some children searched for ways of reconciling the biblical account

with the scientific account of creation, since they felt that the two could or should be reconciled.

Q. (Are you saying that one of these is right and one of these is wrong?)

CELIA (12): One of them must be wrong.

SARAH (12): No, there could be a combination of both.

Q. (How could that be, Sarah?)

SARAH (12): Well, God might have just left the . . . made the world in that, in the burning gases and then left it to cool down and then He started to make things, you know.

One way of reconciling the two accounts of creation was by reducing God to the originating force in the universe without which the universe would never have come into being.

PADDY (17): Everything began with God and will go back to God, but I don't know whether God is a person or a thing. . . . There must have been a God and I think all life came from him and I believe everything evolved after he had started it all. Q. I mean, if there had been nothing before, there would be nothing to start it all off. So God is the only possible word you can use for the initial beginning of life.

Closely related to the problem of the scientific and biblical accounts of creation was the problem of the truth and reliability of the bible. A few pupils accepted the whole bible as true, but many had doubts about the historical value of parts of it, particularly since much was written long after the events.

HEIDI (15): I would say that the bit at the beginning is a wee bit shaky. But there's an awful lot of truth from the history point of view. A lot of the dates and Kings in it are very accurate.

WALTER (16): Parts of it are true, but parts of it are only—they're not completely true. Q. I think that the parts that are most likely to be true in the Old Testament there, I would say, would be David and Saul—around that time. . . . but I think farther back than Moses, I don't think the records would be as good.

WILSON (17): (To) read the Old Testament, one would just think it was just a history of the Jewish nation unless they believed in, they had faith and they believed in the inspiration of God. But the New Testament is, it was written at the time that it actually happened, whereas the Old Testament wasn't, like, the Creation was written a long time after it actually happened. Mankind tends to exaggerate things.

PADDY (17) comments on WILSON's statement: (There is exaggeration) in the New Testament as well because the New Testament and part of the gospels was written some 34 after. . . . In that time, exaggeration could have taken place.

C. THE UNDERSTANDING OF SYMBOLISM

The investigation provided some examples of the way in which young people reached an understanding of the meaning of the symbolism in the Genesis myths. A few primary children reached this understanding, and the evidence suggests that pupils all the way through the grammar school were struggling with problems raised by the literal interpretation of symbols.

Creation

Only a few of the older grammar school pupils expressed the meaning which the creation stories had for themselves.

TERENCE (15): It's not really important how we got here so long as we believe that God made us. The time and all that doesn't really matter.

MAUREEN (17): I think the important thing was 'In the beginning God'—God was there is the beginning . . . it's certainly not an accurate scientific account.

Adam and Eve

In a number of instances, pupils in the upper primary school and in the grammar school expressed the belief that the account of Adam and Eve was a story with a moral, a kind of parable.

IVOR (9): I thought Adam and Eve were just made to show people how wicked they were. Q. I thought that the story was made up and just made up and put in the bible so that people would realise how wicked they were.

PERRY (11): I think somebody maybe used Adam and Eve as a warning because when they did wrong, then, you know, they were put back into dust. And I think they probably made up the story of Adam and Eve as an explanation as to how the first people came onto the earth and as a warning. Q. A warning not to do things which are wrong.

Q. (Has it any meaning for people today?)

No, not really. Now you can think it out for yourself you don't really need it. And it's a bit of a funny way to put it.

BOB (14): I think Adam and Eve is just an example of the bible that is nothing more than an attempt to get over to the people the idea

of God himself starting up life . . . but I don't believe in this at all . . . I don't believe they ever existed. They were just an example.

JONATHAN (15): I think they're symbolic really. They teach how man, how people in general can be tempted by eating the fruit and that's the only reason why they are there.

Q. (Are they real historical people?)

No.

ROLAND (15): I also think they also teach that man is able to choose between right and wrong.

Q. (Is Adam and Eve an historical story?)

ANN (17): No. I don't think so. I can only see it as valuable to children.

It had a great effect on me as a child. I used to think it was a great story.

There is a strong impression that a number of children who achieved some understanding of the symbolic meaning of the Genesis stories did not believe that this meaning had any relevance for themselves. Those who achieved a more abstract level of thinking sometimes both rejected literalism and also any sympathy with the religious understanding of the stories.

4. CONCLUSION

There is obviously a great need for more extensive and thorough research into children's thinking about religious myths and symbols. This would be necessary before one could understand how the theological world view and the scientific world view form in the child's mind, how they relate together, how they synthesise or one becomes completely dominant. Much more would need to be known about the effect on the understanding of myths and symbols of the home environment in which children unconsciously absorb many of the values and attitudes of their parents, and of the influence of religious teaching in day school and Sunday school.

The importance of this kind of research for the future of Religious Education cannot be emphasised too greatly. Paul Tillich (1964, p. 155) has stated that 'the great art of the religious educator is to transform the primitive literalism with respect to the religious symbols into a conceptual interpretation without destroying the power of the symbols.' Writing along similar lines, John Macquarrie (1967, p. 180-1) has argued that 'with the decline of myth as an intelligible form of discourse, religious faith too has tended to decline and Christianity has become less and less intelligible. On an ability to reformulate the

insights of biblical faith in an intelligible non-mythical way that will nonetheless avoid the reductionist error of van Buren and others, may well depend the question of whether our Western culture will continue to hold to its Christian heritage in any lively way, or whether it will turn increasingly in the direction of a pure secularism.' The difficulties of transforming primitive literalism and of reformulating the insights of biblical faith in an intelligible non-mythical way will be obvious to readers of this paper, and they pose the major challenge to teachers of religion at the present time.

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'SUBJECT-MINDEDNESS'—MYTH OR REALITY?

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I. 'SUBJECT-MINDEDNESS' AND SIXTH FORM GENERAL EDUCATION

RECENT proposals for sixth form curriculum reform, such as those put forward by the Dainton Committee (H.M.S.O., 1968) and the Butler-Briault Joint Working Party with its 'Q' level structure (Standing Conference on University Entrance and the Schools Council, 1969), have laid much stress on a 'balanced' curriculum of combined arts and sciences, as distinct from the Crowther Committee's approval of a 'subject-minded' curriculum of purely arts or purely science subjects with literacy and numeracy made possible for all through the judicious use of 'minority' time (H.M.S.O. 1959).

For the past decade has seen the Crowther Committee's concept of subject-mindedness regarded with some scorn in educational circles. Indeed, the concept was seriously challenged almost as soon as it appeared, since immediately after the publication of the Committee's report A. D. C. Peterson, with his *Arts and Science Sides in the Sixth Form* (Peterson, 1960a), blasted the fledgling concept with his well-known empirical enquiry into what subjects sixth formers would choose to study if only they were allowed to make an 'ideal' choice—namely, one whereby they were free to follow their own wishes, instead of being compelled to choose within the circumscribing framework of conditions laid down by the educational system of their country.

Simultaneously, Peterson's article 'The Myth of "Subject-Mindedness"' (Peterson, 1960b) appeared in *Universities Quarterly*, with its charge that specialisation in the sixth form curriculum, through its division into two or more separate 'sides' 'deprives one third of our ablest boys of any advanced studies of history or contact,

in school, with the literature of their own country.' Peterson continues, 'It is this one-sided specialisation which the (Crowther) Report justifies on the grounds of "subject-mindedness". This is educationally a very interesting and unusual approach. It means that the justification for our present system has been found to be not in any quality of the curriculum, but in a theory about the nature of pupils' interests. This is, of course, in line with modern views about "child-centred" education; and if the analysis of the development of adolescent interests is correct, it may well be a justifiable attitude to adopt.'

And clearly the research project which Peterson mounted to find out whether sixth formers do make their choice of specialist subjects for the reasons asserted by Crowther has, over the past ten years, made some impact on educational thinking. Prof. Hirst, for instance, has recently described the committee's concept of 'subject-mindedness' as a 'fantastic contention' and 'a pseudo-justification of a psychological kind' (Hirst, 1969) and refers specifically to Peterson's article on the mythical nature of the concept.

It seems clear, too, that Peterson's notion of general education through combined arts and science courses which are to include 'the four main categories of mental experience', that is, 'the logical and the empirical, the moral and the aesthetic' (Peterson, 1960a) has done something to influence current proposals concerning the sixth form curriculum. The Dainton plan with its combination of maths, arts and science, and the later Butler-Briault proposals for a 'Q' level examination, as well as being influenced by what some see as the need to keep the options for admission to university science and technology departments open, were also impressed by the possibility that such a broadly based specialisation would do much to enhance a sixth former's general education.

2. MYTH AND LOGIC—A REAPPRAISAL OF PETERSON

Now, whether a curriculum such as that advocated by Peterson, Dainton and Butler-Briault is based on sound principles of curriculum construction is an important question, but not one which I wish to consider at this present time.

My purpose is rather first to show that other empirical evidence may be adduced which is apparently in conflict with Peterson's and secondly to consider why there should be such a conflict. I shall suggest that it may be a mistake to go through the usual empirical

and statistical procedures to find out where the discrepancy has its origin, and that an enquiry into the logic of Peterson's conclusions may be more relevant. For the apparent conflict of evidence may be due rather to an unexpected logical error in the interpretation which he laid upon his own findings.

First, however, it is necessary to be clear on precisely what the Crowther Committee meant by 'subject-mindedness'.

The exposition of the concept is to be found in Part V of the report.

Thus (paragraph 333):

'If 'subject-mindedness', a special devotion to a particular branch of study, is a vice of teachers—at least it is often denounced as if it were a vice—it is a virtue among pupils. It is also one mark of the good and keen Sixth Former. He has looked forward to being a science specialist, or a classic, or a historian: his mind has been set that way by inclination and by the main school mechanisms discussed in the last chapter.'

And (paragraph 387):

'The first step in the argument for specialisation is that able boys and girls are ready and eager by the time they are sixteen—the ablest by fifteen—to get down to the serious study of some one aspect of human knowledge which with the one-sided enthusiasm of the young, they allow for a time to obscure all other fields of endeavour. "Subject-mindedness", as we have already noted, is one of the marks of the Sixth Form. It is there whether we use it or not. It is sensible to direct this great emotional impetus towards intellectual effort.'

Now, it is true that such cheerful confidence of utterance begins these days to sound a little naive, for we have come to ask, in a plethora of empirical assertion such as this, for the supporting empirical evidence.

And there may be a good deal that is questionable in Crowther's declaration of faith. For instance, it may be pure supposition that the less able sixth former differs from the more able in respect of 'subject-minded' bias. Wilkinson has made some interesting discoveries on this point, showing that there appears to be no significant difference between able and less able pupils so far as their 'ideal' choice of arts and science subjects is concerned (Wilkinson, 1967).

Undoubtedly, Peterson, in 1960, was right to point to the lack of evidence supporting or refuting Crowther's assertion of 'subject-mindedness'. In support of his own thesis, he referred to Fryer (*The Measurements of Interests*, 1931) who concluded that 'specific educational interests are just as likely to change within a year's time

as to remain the same'. Peterson went on to suggest that there was, in fact, no evidence from theoretical or experimental psychology of limitation and concentration of interest between fifteen and eighteen years of age (Peterson, 1960a, p. 24). Hence his 'Enquiry', involving a sample of 1,565 boys and 1,314 girls from 94 schools of all types in England and Wales (supplemented by 374 pupils in French lycées and 335 in German gymnasien), to find out how far the existing division into arts and sciences coincided with the pupils' declared preferences.

He found that what he called 'the largest single group' of sixth formers would, given a completely free choice of 'A' level subjects, have opted for a course combining both arts and science subjects (Peterson, 1960a, p. 25). Hence he found it necessary to offer a reinterpretation of 'subject-mindedness': "Subject-mindedness", I believe, is a quality which develops as a result of good teaching, and successful specialisation in any subject both can and does exist for quite different subjects simultaneously. It is possible to be passionately interested in both physics and literature and it should be the aim of sixth form education to encourage this rather than to prohibit it on the grounds that it does not conform to some artificially determined and narrowly limited "unity". (Peterson, 1960b, p. 231).

Peterson, then, was concerned to prescribe what in *Arts and Science Sides in the Sixth Form* he saw fit to call 'the integrated curriculum' (p. 10). For such a curriculum would be integrated in the sense that it contained within it *all* of the 'main modes of mental experience', thus contrasting with 'the artificially determined and narrowly limited "unity"' which Peterson saw as implicit in the Crowther recommendations.

Nevertheless, despite Peterson's reference to the paucity of evidence before 1960 concerning the academic interests of this age group, those years during which his research was proceeding and the following decade have seen a number of studies which, if soundly based, may cause us to ask serious questions about the validity of his conclusions concerning sixth formers' interests in subjects.

For example, in contrast with Peterson's view that "subject-mindedness" develops as a result of good teaching,' Meyer (1959), Lovell and White (1958), Hudson (1967 and 1968) and others documented in *Occupational Choice* (H.M.S.O., 1968b) appear to suggest that it is the home rather than the school which influences the persistence of long-term interest in science or arts subjects, and there

may often in different pupils be important predispositions towards one side or the other which may determine to an important degree the pupil's response to his teacher. (See especially Hudson (1967) p. 113.)

However—and this is a point which I wish to emphasise—I am not in this article concerned so much with the empirical validity of this kind of evidence as with the soundness of Peterson's *inferences* from his own empirical findings.

What is disturbing about Peterson's possible influence on some current thinking about sixth form curriculum construction is, I think, the likelihood that many of us are now left with the impression that his 'Enquiry' has proved that sixth formers' interests in academic subjects are homogeneous to a degree which would, *even on the pupil-centred principle of education in accordance with what the pupil is interested in*, justify a 'balanced' curriculum on the Peterson or Dainton formula.

I suggest, however, that the time has come for a reappraisal of the grounds on which Peterson based his plea for an 'integrated' curriculum of the kind he advocated in 1960.

First, we must question the logical validity of his concept of 'the largest single group' of those sixth formers investigated by him at that time.

We may note that, when invited to choose three 'ideal' subjects, 'the largest single group' (39.9%) would have chosen an 'A' level combination including both Arts and Science. The 'next largest' would have presented only Arts subjects (37%), and 'the smallest' only Science subjects (23.1%). (Peterson, 1960a, p. 25).

The important point here is that on Peterson's own showing the 'largest single group', namely, those opting for a mixed arts-science curriculum of three 'A' levels was in fact only about 40% of the total sixth form sample. (Even when invited to choose four 'ideal' subjects, little more than half of the sample wanted mixed courses.)

True, only just over 23% wanted to do a purely scientific course, and only 37% had as their 'ideal' choice a course consisting purely of arts subjects, but the curious thing about Peterson's argument is that he should regard these latter two groups as logically distinct so far as his main thesis is concerned.

On the face of it, there are three categories of interests which are relevant to his conclusion that a mixed arts-science curriculum for all would come closest to coinciding with what his sixth formers were interested in, the categories being those of sixth formers who express

a predominant interest in science, those who express a predominant interest in the arts, and those who appear to be interested to a much greater degree in both areas of knowledge.

Yet, on closer analysis, it is clear that there is a logical fallacy here. For, far from being logically distinct, the two categories of pupils opting for a course consisting entirely of arts subjects and those opting for a course consisting entirely of science subjects are logically homogeneous so far as Peterson's argument is concerned, since what Peterson sought to investigate initially was the question of whether *on the one hand*, irrespective of external pressures such as those exerted by the existing sixth form curriculum, sixth formers had a tendency to gravitate exclusively towards either science or arts sides, or, *on the other hand*, they had a tendency to opt for a combination of arts and science subjects. The proportion of pupils opting for a purely science as distinct from a purely arts course is irrelevant in the context with which we are concerned: what is relevant is whether sixth formers would opt for a 'sidesminded' programme of studies as opposed to one which is not 'sides-minded'.

The point I wish to establish is that by basing his argument that 'subject-mindedness' is a mythical concept on the assumption that *three* logically distinct categories of sixth formers are relevant to his main thesis, Peterson may have done something during the past decade to distort our thinking on the sixth form curriculum.

We should now be in a position to see that if there are only *two* groups of sixth formers who may be logically compared in establishing the validity or otherwise of his argument, a point of some importance emerges from his 'Enquiry', namely, that instead of being the 'largest single group', those sixth formers who would have opted for an 'ideal' course of three combined arts and science subjects were in fact the *smaller* group of the two relevant to the discussion.

To put it in numerical terms, Peterson found, in the responses to this part of his investigation (1960a, p. 25) that those who would have preferred a mixed arts-science course were 39.9% of the total, whereas those who would have preferred an 'un-mixed' course were 37% (wanting purely arts) *plus* 23.1% (wanting purely science) of the total: which gives us a logically valid comparison of 39.9% (opting for a mixed course) with no less than 60.1% (opting for unmixed courses). (This contrasts strangely with Peterson's statement: '... all the evidence I can find indicates that subject-mindedness is ... the exception rather than the rule.' (1960b, p. 228)).

Lest it be said that this is a trivial tinkering about with mere numbers, I would stress again that it is the *overall* impression with which one comes away from reading Peterson's account of his research which may have done something to mislead those who have been, and still are, involved in making highly sophisticated value-judgments about curriculum construction at this level. For example, Wilkinson (1967) makes precisely this mistake, describing Peterson's 40% who preferred a combination of arts and science subjects as 'a majority'.

We can now see that Peterson's 'Enquiry' produced a good deal more evidence of 'sides-' or 'subject-mindedness' than is immediately apparent from the figures as *separately* recorded for arts and science pupils. Indeed, even the evidence from the Lycées and Gymnasien is not as impressive as Peterson would have us believe. In Germany the proportion preferring a combination of arts and sciences (when limited to three main subjects) was 60%, but this means, of course, that there were as many as 40% who wished to make a 'subject-minded' choice. In France the proportion preferring a combined course under these conditions was 36.9%—which means that the high proportion of 63.1% of the French pupils expressed a wish for 'sides-minded' courses. Even when they were asked their wishes concerning a grouping of four 'ideal' subjects, 30.9% of the German and 28% of the French pupils still would have chosen a 'subject-minded' course. (Cf. Peterson, 1960a, p. 26.)

3. 'BALANCE' AND 'LOP-SIDEDNESS'—JUSTIFICATION BY METAPHOR

It appears, then, that Peterson failed to produce good evidence that a 'balanced' curriculum containing a more or less equal weighting of science and arts subjects would 'appear to be much nearer to what they (the English sixth formers) would choose freely than the present specialisation by sides', and the question which we accordingly must ask ourselves is whether a curriculum which would permit some sixth formers to take combined arts-science courses, and others to take purely arts or purely science courses—all supported by well-conceived programmes of general studies (cf. Schools Council, 1969)—would come much closer to what they would freely choose.

Of course, we must take care that, in advocating curriculum construction on the grounds of what sixth formers want, we do not commit the naturalistic fallacy of thinking that the wants of sixth formers are, without further qualification, to be equated with their needs. For

although some sixth formers may *want* narrow specialisation, it could be argued that they *need* a broad and balanced course of studies. (Cf. Dearden, 1966.)

Peterson, as we have seen, has urged upon us the centrality of each of the four 'main modes of thinking' in a sixth former's education (1960a, p. 16), whilst Hirst has grimly warned us that 'the perverted doctrine of the importance of a pupil's present interests', through the risk of a less firm grasp of the basic forms of understanding, may result in 'inequality of educational opportunity of the most far-reaching kind'. (Hirst, 1969.)

However, we must take care that such persuasive terms as 'breadth' and 'balance' do not, with their evaluative overtones, by-pass our rationality: as O'Connor reminds us, 'An undiagnosed value judgment is a source of intellectual muddle. Once we recognise it, we realise that it is not self-evidently true and beyond all criticism.' (O'Connor, 1957, p. 107.)

For many questions may be begged here. Even if the initiation of pupils into ever deeper levels of *all* the basic forms of understanding should be continued in the sixth form, the uncritical use and application of a general taxonomy such as Peterson's may, without a specific working out of what is appropriate in the case of each particular sixth former, lead us to assume first, that all sixth formers for their own good need more or less the same level of competence as one another in each of the basic forms of understanding and, secondly, that our society in general will receive the greatest possible advantage from this kind of cognitive breadth. (Cf. Wilson, J., 1969.)

What is lacking in Peterson's argument and arguments derivative from his way of thinking is the establishment, or consideration, even, of criteria which will enable us to decide whether it is in the interests of each sixth former to have a near 'A' level understanding of, for example, the differential calculus, or whether a different level of maths is more relevant to his *general* education—such as would give him, say, the capacity to interpret intelligently the party political histograms which appear in the national press at election time.

Nor is it by any means clear that the greater 'balance' of a Peterson-Dainton-'Q'-Level formula will meet the diverse requirements of *society* any better than a curriculum which allows the greater possibility of option and concentration of the pupil's interest. Certainly, modern society needs its professional specialists if it is to survive; but one may also argue in respect of *general* education that although

all adult members of our society should no doubt possess certain kinds of knowledge in common—knowledge of democratic procedures, or of the hazards of atomic fall-out, for example—nevertheless it may be a good thing if, where less essential knowledge is concerned, diversity of competence and biases of interest are encouraged. Against the ‘lop-sided individual’ gloomily envisaged by the Butler-Briault Working Party perhaps we should juxtapose Richmond’s view that ‘So long as it is accompanied by real penetration, no matter where or in how limited a field, one-sidedness is not to be thought of as a vice, a disfigurement. It is not as if human beings were so many ships, perpetually in danger of capsizing if they listed too far to port or starboard.’ (Richmond, K., 1963, p. 180.)

What Hudson has to say about ‘specificity of interest’ (1967, p. 64) may be relevant here. For ‘We must envisage a spectrum of individuals ranging from those who can apply their full energy to any task, to those who can apply themselves only when their special interests are aroused.’ Moreover, ‘research on adults suggests that the ability to channel one’s interests, even obsessively, may be a condition for producing original work’ and ‘It may be, therefore, that the ability to turn one’s hand to any task is not necessarily an unalloyed advantage. Instead of describing such people as “brilliant all-rounders”, perhaps we should view them instead as intellectually “labile”, or even as “promiscuous”.’

And although Hudson cautiously observes that the analogy with sexual promiscuity is ‘obviously unnecessarily pejorative’, he goes on to raise the provocative question as to whether ‘the education we give children serves to accentuate their promiscuity quite unnecessarily.’

There is, no doubt, much in Hudson’s contention that calls for the cool appraisal of the analytical philosopher. Nevertheless, at this time of increasing pressures towards ensuring that sixth formers cover a broad conspectus of knowledge, perhaps we should begin to ask more searching questions concerning the rationale on which the reaction against Crowther’s ‘subject-mindedness’ should be based.

For instance, if literacy and numeracy are essential criteria by which we may distinguish the educated person, perhaps we should ask more searchingly than in the past what literacy and numeracy are relevant. To pose a rather Spencerian kind of question, perhaps we should begin to ask ourselves *what* science is of most worth. Much of the high-level thinking about education done by such people as Peters and Hirst, although enormously valuable in the clarity it

brings to educational discourse, is not, where detailed and particularist decisions have to be made about curriculum content, very helpful simply because it is at a high and generalised level. This is not to say that Hirst's taxonomy of the forms of knowledge and awareness is not helpful in giving the educator a general aim: no doubt cogent reasons can be advanced in justification of the view that all children should be initiated into all of the basic forms of understanding. What Hirst's classification of these major objectives fails to do is to help us decide what *degree* of initiation into the different forms of awareness is appropriate for any one child. Does it matter, for example, if a sixth former in the course of his general education never goes so far into the scientific form of knowledge that he comes to understand the second law of thermodynamics? And if it matters, then why does it matter? And if it doesn't matter, then why doesn't it matter? If the fact that he has not explored the inner reaches of physics is occasioned by the extra amount of time he has spent on, say, food and population problems or industrial design or the sociology of the family then, once more, does it matter, and if so, why?

4. CURRICULUM AND RATIONAL JUSTIFICATION

It may be that the time has come when we need to begin exploratory work on a taxonomy to complement that of Hirst. For what we now need to do is work out a set of criteria by which we may decide what, in each of the basic forms of understanding, there is that all should know and what may more properly be regarded as optional. Then, perhaps, we should be able to see that letting what pupils are interested in influence the selection of curriculum content need not be the child-centred perversion which Hirst fears. Nor, on the other hand, would an attempt to take all sixth formers *some* of the way further into each of the forms of knowledge necessarily appear to be a conspiracy by well-intentioned enthusiasts to force the unwilling to join their club. For, given such a taxonomy as that suggested above, we should at last, in contrast with much of the present level of debate on the sixth form curriculum, be in a position to justify our curricular prescriptions rationally.

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PIAGET'S QUESTIONS TO YOUNG CHILDREN: AN ANALYSIS OF THEIR STRUCTURE AND CONTENT

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ABSTRACT

The child's conception of the world cannot be deduced from his answers to questions. On the one hand his interpretation of the question may in itself reveal characteristics about the child's view of the world. The questions Piaget has put to children during his research, however, are either ambiguous or tendentious. Consequently the answers received do not necessarily follow from the child's conception of the world but quite probably from his expectation of the kind of answer required.

I. INTRODUCTION

THE purpose of this study was to discover whether the child's developing conception of the world could be inferred from the answers given to questions based on Piaget's questioning of children, especially in his book, *The Child's Conception of the World*. Piaget found from the responses of children between 3 and 11 years old that in this age group there is, to varying degrees, (i) confusion between the sign and the thing signified; between internal and external—'the word is the thing'. He calls this situation 'nominal realism'; (ii) the child confuses his own self and the outside world. He begins by regarding his own point of view as absolute. He is the centre of the world; (iii) because he is egocentric and he is alive he believes in an animistic world in which natural phenomena are seen as anthropomorphic. Everything has a reason and a clear function; (iv) the child has powers to make things happen or prevent things from happening by his own 'magical' powers; (v) he displays a conviction of artificialism—everything is made by man for man. God is a kind of man.

In order to elicit responses which would enlighten him about the way in which the child perceived the world and interpreted natural

occurrences Piaget asked questions designed to stimulate the child to produce answers. These he categorised under five headings: romancing, answer at random, suggested conviction, liberated conviction, and spontaneous conviction. (1951, p. 10ff) Piaget was aware that, to some extent, the kinds of answers given were conditioned by the limitations of the language used. He noted that 'it is not the child which is moulded by language; it is the language which is already childish'. (1951, p.250)

Strangely enough, he did not pay much attention to the form in which his own questions were posed. Those who are skilled in devising questions for market research, opinion polls or the more sophisticated procedures of sociological enquiry are conscious of the way in which a vague, ambiguous or loaded question can provoke a response which, for the purpose of content analysis, is all but worthless. A vague question is likely to draw forth a vague, eccentrically spontaneous or misleading reply since the recipient is quite likely to have misconstrued the referents in the sentence and to have interpreted the intended sense in either an orthodox or unorthodox manner in terms of the expected type of response. (Atkinson, n.d.; Oppenheim, 1968).

An ambiguous question, too, lends itself to one of two constructions. Two kinds of answers are, therefore, logically possible although in the mind of the interviewer only one is intended. The loaded question includes at least one term that states an assumption about the recipient. The adult may spot the inferences in such a question and ask for a rephrasing this time without the prejudicial term or terms, i.e. 'Do you eat with your fingers?' instead of 'When did you last eat with your fingers?' The child will accept the loaded question probably because the interrogator is an adult who, in his relative omniscience, is allowed by the young person to hold such preconceptions. Since language determines our concepts, vague, ambiguous and loaded questions are very likely to elicit cognate responses from children. The questions asked are all-important in a study of this kind. By examining the children's answers as responses to certain verbal stimuli we may deduce the value of the question in provoking an answer which does or does not reveal the child's conception of the world.

For the purposes of this study 50 children aged 3-11 were asked questions similar to or exactly the same as those recorded by Piaget in his work, *The Child's Conception of the World*. The respondents in each age group were as follows: 3-4½ (9); 5-6½ (8); 7-9 (16); 10-11 (17).

2. THE QUESTIONS

1. *Does the moon move?* (Piaget, 1951, p.147)

This seems to be open-ended but the close relationship between 'does' and 'move' although inverted for the question structure may still implant in the child's mind the high probability that the moon is capable of movement. To say that because the word 'move' may be applied to a non-human phenomenon we immediately endow it with a human attribute is not at issue here. Given that in European languages, as Piaget himself points out, we split sentences into subject and predicate so that 'the wind blows' gives the impression that the wind may be independent of the action of blowing (Piaget, 1951, p.250) the question 'Does the moon move?' tends to reinforce the concept of autonomous action which our syntax encourages.

In examining responses to this question we must expect even of 3 year olds that they have been linguistically conditioned to view the external world as animistic. The replies from our group of 3-11 year olds suggest that the moving of the moon is self-evident, not necessarily as a result of direct observation but because of the logical potential of the language. 42 children said 'yes'; 7 said 'no' and one didn't know. Several children added colourful explanations—'in the sky'; 'it follows us in the car' (3-4½ age group); 'when I move, it moves'; 'the spacemen came'; 'even though it ain't got feet' (5-6½ age group); 'on its axis'; 'wind blows it'; 'might bump into the planets' (10-11). But of the total responses only 6 showed evidence of answers derived from personal observation. The remainder drew on poetic imagery or traditional, sometimes scientific knowledge, e.g. 'floats', 'flies', 'on its axis', 'wind blows it'. One respondent in the 3-4½ age group evidently showed signs of divergent thinking based on personal observation. This child thought that the moon did not move because 'it doesn't go anywhere; you can see it in the morning'. There were other negative replies but only this child gave a specific reason for construing the question as an open-ended enquiry.

2. *Where do we come from?*3. *Where do you come from?*

Neither of these questions appears in Piaget's study. Question 3 evoked a mixed response which is to be expected in view of the equivocal nature of the sentence. 'You' may mean either 'you as an individual' or 'you as a typical example of everyone else'. When the latter meaning is inferred by the child he may read into the enquiry

the assumption that he is being questioned about his entry into the world rather than his place of birth or present residence. Even a differing inflexion of the voice may in Q.3 alter the possible semantic construction of the question so that a slight emphasis on the word 'you' may well suggest that the child's geographical provenance is the answer required. Q.2 more clearly indicates by its inclusive use of 'we' the question of birth. In response to Q.2 all the children clearly understood the question to mean 'How did you come into the world?' and answers ranged only from 'God' and 'Heaven' to 'mummy', 'inside mummy's tummy' and the more factually informative details of procreation from the older children (10-11).

Q.3 on the other hand elicited a variety of responses, this range of interpretations being shared right through the age ranges. All the groups contained at least one child who assumed the questioner to be referring to birth. Other replies—'London', 'Weston-super-Mare', 'Birmingham', 'Watford' and other place names spread throughout the age groups—showed a quite different understanding of the question, although an equally valid one bearing in mind the ambiguity of the question. Only one child—in the 3-4½ group—misconstrued the tense of the verb and answered 'from home'.

4. *What is 'being happy'?*

This question is similar in its construction and questioner's expectation to Piaget's 'What is a thought?' Here the phrase 'being happy' coupled with the verb 'is' would appear to be searching for a second order philosophical comment on the nature of happiness. The question, as understood by a more reflective older child or adult, is universal and does not anticipate a personal, individual example of a happy incident or feeling. All the younger children gave examples of the latter. Some were more overtly subjective than others: 'Christmas', 'when it's summer', 'when I'm glad', 'having lots of toys', 'when I've got something nice'. All seventeen respondents from the groups 3-4½ and 5-6½ gave this kind of answer. Some children in the two older groups were aware of the implication of the question and gave a more definitive response e.g. 'a feeling that makes you do nice things' (2 ten year olds) but the others referred to examples of personal value—'bonfire night', 'Christmas', 'when Spurs win'.

These results do not prove that children aged 3-11 have no abstract concept of happiness. A more suggestive inference is that the

younger child, as Piaget remarks, (Piaget, 1952) is highly egocentric and thus interprets the question as tacitly adding the words 'for you' or 'as far as you are concerned'. This does not rule out the possibility that the child has noticed the symptoms of happiness in others and that he is capable, therefore, of producing a more universal and more detached appraisal of the term 'happiness'. All we can say in this instance is that the form of the question "What is 'being happy'?" has been interpreted, in the majority of cases, as if referring only to the individual "questionee", an interpretation that is quite acceptable considering the blunt and unelaborated form of the question.

5. *Tell me a strong word*

Here Piaget (1951, p. 45) has deliberately set out to enquire whether the child is able to dissociate the 'thing' from the word which symbolises it, or whether he believes in word-magic. (Cassirer, 1946). Again this is an attempt to discover whether children can abstract the sound from the sense. One might anticipate a scale of responses ranging from nominal realism in its extreme i.e. the word does not necessarily sound strong but merely symbolises an example of a strong thing e.g. 'house'; onomatopoeic words which sound strong and stand for something that is universally regarded as strong; a word which has a strong sound but carries no semantic sense of strength. The difficulty here, of course, is that any analysis of the responses is bound to be largely subjective. Where there is general agreement on the semantic strength of a thing, there are disputes about whether or not a word has a strong sound. The very term 'strong word' is metaphorical. It is therefore acceptable to explain one's choice of word as stimulated by a literal translation of 'strong'. This would be a quite perceptive justification but whereas an adult might reject the term 'strong word' as literally nonsense, the child is more inclined to accept this loaded question and assume that there must indeed be such things as words that are strong 'in themselves'.

The answers given to this request show all three possible kinds of inference: 1. nominal realism. 2. onomatopoeic words. 3. words with no semantic sense of strength.

- 3-4½: wind (1), baba (1), Humpty Dumpty (1), elephant (1), giraffe (1), house (1), table (1), apple (2)
 5-6½: table (1), thunder (1), man (1), great (2), giant (1), cheese (1), brain (1)

- 7-9: fighting (2), no (3), hailstones (1), smash (3), strong (1), great (2), dog (1), drag (1), don't know (2)
- 10-11: muscles (2), get lost (2), heave (2), bold (1), brilliant (1), muscular (1), mighty (1), rope (1), tree (1), witchcraft (1), steel (1), don't (1), thunder (1), Constantinople (1)

To categorise the above words into the three groups of responses would, however, be misleading and forced. While some lend themselves to uncontroversial classification—table, cheese (category 1); smash, heave, mighty (category 2); Constantinople (category 3), other words are of doubtful classification. Is 'apple', for example, a strong-sounding word to the child or does it signify something which he endows with some personal interpretation of the term 'strong'? 'Cheese' seems to equate 'strong' with 'strong-smelling' and 'no' and 'don't' are more indicative of strength of will than muscular strength. 'Witchcraft' too may not only sound strong in itself but the sense of "power over mind and body that magic incantations and supernatural spells are deemed by some to possess" adds another interpretative dimension to the highly emotive term 'strong'.

6. *Where do you think?*

Piaget's question was 'What do you think with?' (1951, p. 39). 'Where do you think?' is a less limiting, more ambiguous question designed to add to the different forms of enquiry used in the present study.

Like Q.3 this question lends itself to at least two interpretations. 'Where' can mean 'in which physical location' or 'in which part of your body' and the answers from the children display this choice of inference. All the children aged 7-11 replied either 'in the head' or 'in the brain' except for one 7 year old who said 'in bed'. The youngest group gave the following responses: 'in the head' (4), 'by the church' (1), 'by my books' (1), 'arms' (1), 'banana' (1). The 5-6½ year olds answered in this way: 'in the head' (4), 'in there' (finger at side of head) (1), 'in the brain' (2), 'in school', (1) 'in my chest' (1).

If the question is intended to throw light upon the child's self concept in relation to the external world and to his awareness of non-tangible operations within his own body, the above responses are not particularly helpful. The mixture of replies in the two youngest age groups may suggest a restricted ability to perceive the self as an entity separate from external phenomena. But they may also show that the children consider themselves as persons who use their

faculty of thought only on specific occasions connected with particular places—by the church, by my books, in school. Taken in this way, what might otherwise be regarded as naive responses show a marked degree of objective observation with regard to the physiological processes.

7. *What is a thought?* (Piaget, 1951, p.50)

This question constitutes a test of vocabulary in the first instance. The 3-4½ year old who answered 'trains' had either no understanding of the abstract noun 'thought' or, perhaps, he had heard the phrase 'train of thought' and the concrete, familiar object 'train' remained in his memory, somehow inexplicably linked with the sound conveyed by 'thought'. All the other children showed by their responses that they perceived a relationship between 'thought' and 'thinking'. Here is a sample of their answers: 5-6½: 'when you think about ghosts or when you're going to be sad', 'something you think about, of course', 'when you have an idea about something and afterwards you can work it out'. 10-11: 'a thing you think', 'something in your mind', 'an idea in your head', 'a process in the mind'.

These responses show the neatest gradation of all answer categories so far. There is a clear development from a thought being the thing thought about—a variation on Piaget's 'nominal realism'—to a distinction between a particular example of something imaged in the brain ('nice things', 'when you think about ghosts . . .') and the generalized concept of a thought as a mental process. This gradual refinement and abstraction of definition through the age groups could indicate that the child acquires the ability to consider the word as an autonomous symbol independent of his own existence only in proportion to his familiarity with the word's usage. Without knowing how often a word is used by or in the presence of a child we are not able to make judgements about his concept of the world as depicted by his interpretation of verbal symbols. As N. M. Simcox has remarked, 'there is a need for increased awareness of some children's limited understanding of some phrases in daily use . . . phrases such as "any", "only", "whether"'. (1970, p.77)

The question, 'What is a thought?' is only a conveniently terse way of posing this question more obliquely: 'You know when you look forward to nice things like holidays and birthdays or not so nice things like rain and cold weather you're thinking about them, aren't you; and these are called "thoughts" and we have lots of thoughts

don't we. What do you suppose a thought really is?' In this more elaborate example above, the child is not necessarily being given any new information. The question has been designed not to predetermine the response but to narrow its possible field by clarifying the questioner's expectation. By giving examples at the beginning, he makes it plain that an example of a thought is not what is required. Phrased in this way the question is now seeking the child's concept of 'thought' and not testing his knowledge of words.

8. *Where do you dream?*

Piaget's question was 'Where do dreams come from?' (1951, p.89 and 93). This question may be grouped with Q.6 above. It provoked a similar range of answers because it was couched in ambiguous terms. Out of the total of 50 responses 'in bed' featured 13 times, 'in the head' 12 times, 'brain' (8), 'chest' (4), 'stomach' (4), 'in my sleep' (3), 'in my eyes' (1), 'neck' (1), 'mind' (2), 'in my mouth' (1).

9. *Where does the wind come from?*

This is based on the structure of Piaget's question, 'Where do dreams come from?' Here again 'come from' may be interpreted in three ways: 'from which direction?', 'from which geographical area?', 'who or what causes it?'. The 3-4½ group answered 'sky' (3), 'don't know' (2), 'God' (1), 'across the fields' (1), 'up the tree' (1), 'Bristol Channel' (1); the 5-6½ group replied 'sky' (2), 'God' (1), 'sea' (1), 'behind the clouds' (1), 'heaven' (1), 'North' (1), 'South Pole' (1). The 7-9 group: 'sky' (8), 'everywhere' (1), 'rain makes it blow' (1), 'behind the clouds' (1), 'nowhere' (1), 'South' (2), 'trade winds' and a technical explanation (2); 10-11: 'chemicals' (3), 'sea' (3), 'air' (3), 'sky' (1), 'waves' (1), technical explanation (1), 'South Pole' (1), 'heavens' (1), 'vacuum' (1), 'clouds' (1), 'North Pole' (1), 'North, South, East and West' (1).

We cannot draw up a scale of sophistication in this case in order to classify the responses in terms of mature and naive concepts. Although, after the age of 6½ the children did not ascribe the origin of the wind to God, it cannot be concluded that they are ignorant of the more scientific explanations. The younger children have construed the question in a particular way which limits the kind of response that is consequently permitted. Unless we question them further on the subject we might assume from their answers that they have dismissed the technical, meteorological explanations of the

source of the wind as merely a superficial answer, preferring to see the question as referring to some Ultimate First Cause.

Analysed in this way, the 'depth' of response is in inverse proportion to the children's ages. Nor can we account for the answer 'God' among the 3-6½ year olds as the kind of response Piaget calls 'suggested conviction' (1951, p.10ff) since other answers such as 'trade winds', 'sea', 'air' and chemical reactions may similarly be based purely on information received through others.

10. *Who made the wind?* (Piaget, 1951, p. 256)

Apart from one 6 year old who said 'don't know' and one 11 year old who was sure that it was a case of 'air going mad' all the children said that God made the wind. This is another tendentious question, akin to Q.5 ('Tell me a strong word') in that it carries its own assumption, in this case that some person or human-like being did in fact create the wind. Since this question was put by an adult and since the children have undoubtedly in the past been given no alternative human or Divine Being as a possible creator of such natural phenomena, the question is hardly interrogative at all. It is over-limiting and as a verbal stimulus it carries a highly predictable response.

3. CONCLUSION

The responses to the ten questions put to the sample of children aged 3-11 in this study do not necessarily invalidate Piaget's hypotheses concerning the child's conception of the world. They do, however, cast doubt on the interview as an efficient method of clarifying our knowledge of the child's perception of and attitude towards external phenomena and his own self. The answers that children give to questions depend on the structure of the questions. According to this view it is not justifiable to judge the child's conception of the world as naive or uninformed, animistic or egocentric; nor can we state with any degree of certainty that children are unable to distinguish words from the ideas or objects they represent.

The child answers questions in the light of his personal interpretation of what is required by the interviewer. The words used in the question will, therefore, precondition the response. 'Who are you?' is quite a different enquiry from 'What is your name?', the second being directed towards a limited response while the first may be seeking to discover the child's identity in relation to others e.g. son, daughter, nephew, niece, or various clues to individuality such as 'the girl who lives in No. 12' or 'the tallest boy in the class'.

The type of question that seeks a particular kind of response but at the same time is capable of being understood to have a number of possible meanings is not a valuable method of enlightening the observer about the child's conception of the world. In the same way, questions used in intelligence tests and other questionnaires specifically designed to produce results that can be objectively assessed are inefficient if their structure and symbolism admit of more than one answer. Where this does apply—as in all ten questions posed during this study—there is a danger in evaluating the responses in gradations of sophistication. On closer scrutiny of the child's interpretation of the question the innocent reply may indicate a critical and agnostic approach that is usually assigned to maturity. On the other hand, the child who, by his verbal response, seems to have misunderstood the question's intention, may not be revealing his conception of the world. He may only be giving a response that he sees as logically predetermined by the form of the question.

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A SOCIO-PSYCHOLOGICAL INVESTIGATION OF RADICALISM, NATURALISM, AND TENDER-MINDEDNESS OF TEACHERS IN FOUNDATION ART CLASSES

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Some reappraisal of the role of Art colleges has been undertaken by the Coldstream and Summerson committees, and these have highlighted the rather ambiguous position in Further Education which such institutions occupy. This article attempts to analyse this ambiguity in terms of the different patterns of interpersonal relationships in Art colleges, seen as a function of both established institutionalised behaviour and of the contrasting personality structure of Art College teachers.

I. INTRODUCTION

OLIVER (1953) suggested that discussion of educational attitudes might be clarified by the use of a taxonomy of theories derived from empirical evidence, combined with theoretical concepts which educational philosophers have distinguished both in this country and in the United States. In particular it was thought such an approach would prove useful in determining basic dimensions on which teachers' attitudes towards education could be placed and measured. From the writings of theorists Oliver describes the distinctions which are drawn between idealism and naturalism. Briefly, idealist theories value those human characteristics which are akin to those of a permanent social order, whereby each generation has some body of altruistic, absolute truths at which to aim. In American terminology this would be referred to as essentialism and perennialism. Idealism thus presupposes an orderly Universe displaying the best characteristics of human personality, that is reason and will, which is permanent and unchanging, and at which succeeding generations aim. Absolute standards of truth, goodness, beauty and justice exist to which human endeavour should be directed, and the educationalist's task is seen as assuming the responsibility for the development

of children's personalities along these traditional lines, by the selective presentation to the child of all that is best and praiseworthy, in the history of mankind. High levels of aspiration are an essential aspect of idealism, exhorting the learner to achieve the very best standards of knowledge and understanding. As Sir Fred Clarke (1947) puts it:

The view taken in this book is that there are ultimate standards, common to, and authoritative for, all alike; and that belief in them in some form is necessary both for social cohesion and for an adequately purposeful education.

In short one may summarise idealism as 'other wordly'.

Naturalism takes an opposite view. Human characteristics are not viewed as part of an established universal order, but are to be regarded as the unstable products of evolving life. Thus concepts of truth, justice, goodness, etc., are flexible and may vary from age to age in relation to the developing nature of society. Thus naturalism stresses individual rather than collective standards, and values self expression, motivation, interest, and perceptual experience, maintaining that education should change, and teach that which is most relevant at any particular stage in our evolution. As John Dewey (1916) writes:

Our net conclusion is that life is development, and that developing, growing, is life. Translated into its educational equivalents, this means (1) that the educational process has no real end beyond itself; it is its own end; and that (2) the educational process is one of continued reorganising, reconstructing, and transforming.

Pragmatism, progressivism, and reconstruction seem to reflect a general naturalistic approach and we may summarise this ideology as 'of this world'.

Oliver and Butcher (1962) added two other dimensions to that of naturalism/idealism, both of which had been determined empirically by investigations into the structure of general social attitudes. In particular the two well known factors of radicalism/conservatism, and tough-mindedness/tender-mindedness as reported by Eysenck (1954), were considered to be particularly applicable to educational investigation. A tender-minded attitude to education may be interpreted as one which regards children as individuals, to be treated carefully and as ends in themselves, rather than as a mere class unit which must be moulded in order to serve the needs of others. On the other hand, people who regard schools as being merely places for vocational

preparation, or for the conditioning of future party members, may be said to have a tough-minded attitude to education. They rate good behaviour—especially quietness—high attainment, the ability to carry out instructions, sociability, and leadership qualities as of paramount importance; attempting to mould the child to fit existing patterns of behaviour rather than allowing him to develop his natural individuality. As Francis Stevens writes in *The Living Tradition* (p. 57): 'However well the child may be treated as a person, he is thought of as a pupil chiefly in relation to his suitability for a certain assignment of learning and not as the object to which the curriculum is adjusted'. The tender-minded person regards the preservation of the individual's essential dignity and uniqueness as paramount, and argues that syllabuses should be child centred, and not geared to the demands of the state, industry, or any other external pressure group. The radical/conservative scale is intended to assess the differences which people exhibit over the question of change. How much do people want change, in what direction is change required, to what degree must change be introduced, and in which areas are changes needed? Thus we have three dimensions around which the beliefs and opinions of teachers about education may be expected to be structured, namely:

the naturalism/idealism scale

the radical/conservative scale

the tough-minded/tender-minded scale

Each of these scales employed in the *Survey of Opinions about Education* makes use of the Likert technique, in its attempt to quantify personal opinion.

2. PREVIOUS RESEARCH

Research in the field of teacher opinion has established several important facts, not the least of which is that graduate students in training are more idealistic and tender-minded, but less radical than college of education students (Butcher, 1965). Presumably these differences will characterise the Grammar School teacher (of whom 78% are graduates) as distinct from the Secondary Modern teacher (of whom only 17% have achieved graduate status). This supposition is in fact supported by recent research carried out by Oliver and Butcher (1968), results of which are summarised below:-

TABLE 1
ATTITUDES OF TEACHERS ACCORDING
TO TYPE OF SCHOOL

<i>Sample</i>	<i>No.</i>	<i>Naturalism</i>	<i>S.D.</i>	<i>Radicalism</i>	<i>S.D.</i>	<i>Tender-mindedness</i>	<i>S.D.</i>
Sec. Mod	54	74.69	8.70	114.87	13.56	128.48	14.08
Grammar	34	69.79*	8.51	107.88	17.25	136.12*	14.87

(*P < .05)

Pollock (1965), too, discovered similar trends, although particularly in terms of tender-mindedness, the position of Grammar School teachers was much less clear. Readers should note that the research by Pollock made use of the newer, shorter scales which have been developed out of the longer experimental scales quoted in reference to Butcher's and Oliver and Butcher's work (1965/1968). Cortis (1968) also researched along these lines reporting that idealism was related to academic success whilst naturalism was related to practical teaching success, again suggesting that the Grammar School teacher would score higher on the idealism factor. Morrison and McIntyre (1967) found that non-graduate women after one year's teaching were more naturalistic and more radical than graduate women; but as Pollock found, the situation in respect of tough-mindedness was more confused.

3. AREAS OF INSTITUTIONAL CONTRAST

Further analysis of the Secondary Modern/Grammar School will lead us to consider the following hypotheses as possible explanations for the reported greater idealism, conservatism and tender-mindedness of the selective school. (a) The Secondary Modern school is non-selective: it must accept all comers except the clinically diagnosed. Thus it encounters more disciplinary problems than the selective Grammar School and is forced usually to adopt repressive or tough-minded measures to achieve compliance. Partridge (1966, p 31). writes: 'As in many other schools, the measure of the successful teacher is his ability to awe a class into submission'. Or again, as Webb (1962) maintains the Secondary Modern school assumes a custodial or missionistic function, with the teacher acting out the role of 'drill sergeant' in order to exist. This contrasts directly with the academic role of the Grammar School in which is made possible a greater degree of tender-mindedness.

(b) Both the Grammar School and the Secondary Modern school function as normative institutions, in the sense that society expects them to inculcate social norms and values as well as transmit knowledge. But, as Floud and Scott (1956) point out, Secondary Modern teachers are drawn predominantly from working class backgrounds (46.6% as opposed to the 32.4% of maintained Grammar Schools, and only 18.6% of direct grant Grammar Schools) and such teachers may not so readily accept middle class values and norms. This could generate within them, therefore, a more naturalistic approach to teaching, leading them to appreciate perhaps that the working class culture does not place the same emphasis on academic achievement.

(c) The Grammar School may be regarded as a training ground for the production of elitist cultures, for example, managerial, economic, intellectual, political, or scientific; and a system described by Turner (1960) as 'sponsorship' is operated whereby there is controlled selection of the individuals who are to be socialised into membership of the various elites. Thus the Grammar School is pervaded to a considerable degree by the cultural standards of these external groups, and a system of external examinations was developed to assess the success of this acculturation process. Some degree of uniformity is presupposed which is directly at odds with the Modern school concept of variety. This variety is reflected by the following statement which appeared in Pamphlet No. 9, *The New Secondary Education*, page 29: 'The aim of the Modern School is to provide a good all round secondary education, not focussed primarily on the traditional subjects of the school curriculum but developing out of the interests of the children'. Surely such a degree of variety implies both a naturalistic and a radical/experimental approach to teaching, reflecting a willingness to link subjects taught with individual and social needs, and to initiate changes according to the need-press situation in the external system.

(d) We may also consider the hypothesis that education has both a functional and a symbolic value. The value is functional when education is used directly to accomplish a purpose; it is symbolic when it is used as a symbol of status. We have demonstrated already that the selective stream of education is perhaps more concerned with the symbolic aspects in the sense that students have to overcome a series of status building hurdles, and then have usually to 'learn on the job'. For example, boys interested in business management or personnel management are expected to follow similar courses at Grammar

School, followed by a University course in management science or psychology, and then they will be required to undergo further training in the factory. The Grammar School does not equip such students in any practical way, it merely processes them as suitable material. The Secondary Modern school or non-selective stream of education may therefore be regarded as functional in that no real status is achieved (except for the few candidates who enter for G.C.E.) and the object behind the schools' educational policies is to enable the child to function at a useful level in society. If we accept this hypothesis, is it not implied that the Modern School teacher will be less traditional and idealistic, for the sorts of status at which the Grammar School aims are relatively constant and are supported by idealised role conceptions?

(e) Davis (1967, pp. 183, & 190) makes two interesting points in his splendid 'apologia' for the selective schools when he maintains that: 'There does exist what may be called a Grammar School mind which can be differentiated' and writing of the teaching methods of the Modern School: 'There the approach is more graphic, and often more imaginative and experimental than in the Grammar School'.

The selective school is to be regarded as a 'sit down and think' school for 'sit down and think' types, implying less room for experimental and naturalistic teacher behaviour.

Any further discourse of this nature may justify charges that sociology is the painful elaboration of the obvious; sufficient argument has perhaps been offered to explain the differing attitudes of Grammar School and Modern School teachers. In any event the full anomaly of the situation now presents itself in a much clearer way. In the Grammar School, where idealism and conservatism are greater, the expected teacher tough-mindedness is absent; in the Secondary Modern school where radicalism and naturalism are apparent, the unexpected teacher tough-mindedness is present. In his study of teachers' role conflict, Musgrove (1967) establishes that Modern School teachers experience more role conflict than Grammar School teachers and suggests: 'The greater proportion of teachers in high conflict in Modern Schools compared with Grammar Schools is not surprising in view of the less certain objectives of the former'. Is it not possible that this higher degree of conflict is explainable in terms of personality differences, i.e. the Modern School teacher being less traditionally minded and inner-directed than his Grammar

School counterpart, but finding the Modern School ethos unsympathetic to the expression of his greater radicalism and other-directedness?

4. CHARACTERISTICS OF THE FOUNDATION YEAR

Where does the Foundation year in an average Art College fit into this pattern? It is the author's contention that this year can best be equated with the last year in the Modern School in so far as:

(a) The Foundation Year is basically non-selective. Indeed many would claim that the Foundation intake into Art College is truly comprehensive, in that a full range of ability from two, three or more 'A' levels down to no 'O' levels exists. In the current Foundation year at Bournemouth for example, the numbers of students coming from the various categories of schools are Grammar 52, Modern 29, Private 23, Technical 8, and Comprehensive 6.

(b) Unlike either the Modern or the Grammar School, an Art College functions mainly as a utilitarian institution and not as a normative one. As a measure of the extent of this utilitarian approach, we may quote from the *Robbins Report* (1963) the following statistics:

1. In Art Colleges 18.6 hours out of a total teaching week of 21.5 hours were devoted to practical work. (p. 315).
2. 54% of art students received no formal lectures a week, while 96% received less than 5 hours per week. (p. 318).
3. 79% of art students attended no discussion periods (p. 139).
4. 42% of art students were required to produce no written work and 77% produced written work less frequently than once a fortnight. (p. 325).

In short, confirmation of a later assumption made on this page that Art Colleges are 'stand up and do' places.

Art Colleges do, however, have a few normative qualities (e.g. they deprecate the publicising of pornography by students, and they seek to regulate the behaviour of their female students in digs), but they have more in common with the Modern School whose normative function may also not always be complementary to that of the Grammar School.

(c) Art Colleges are not concerned with elitism, and reflect the variety, diffuseness and student centred approach of the Modern School.

(d) Like the Modern School the education offered has a functional rather than a symbolic value. The majority of courses offered are basically vocationally orientated, and the college concerns itself

directly with the production of good graphic designers, good fashion designers, good photographers or whatever.

(e) An Art College is also more of a 'stand up and do' place and certainly employs as Davis suggested the Modern School did, a graphic, experimental and imaginative approach.

5. CHARACTERISTICS OF FOUNDATION STAFF

What we are claiming, therefore, is that the trend towards naturalism, radicalism and tough-mindedness revealed in the attitudes of the Modern School teachers will positively correlate in terms of the N/I and R/C dimensions, and negatively correlate in terms of the T/T dimension, with the educational attitudes of Foundation staff operating within the constraints just described. We anticipate this pattern not only for the reasons discussed under (a)-(e) above, but also because:

(a) At the Foundation stage the College no longer has to function at a custodial level, in so far as its students are not compelled by law to attend. We assume, therefore, that student interest and motivation are higher than in the Modern School and will permit a much more liberal and tender-minded staff approach.

(b) In a previous paper the author (1969) established that Foundation students could be differentiated from comparable groups of non art students on four personality dimensions:

1. A - ($P < .001$) more stiff, cool, tending to be critical and obstructive.
2. G - ($P < .01$) somewhat more undependable, fickle and impatient.
3. Q_3 ($P < .01$) of poorer self sentiment.
4. Q_4 ($P < .001$) more tense, restless, excitable; a poor group member.

Furthermore Foundation students were significantly more aesthetic and less social in terms of their A.V.L. scores and were significantly biased as a group towards tough-minded radicalism (Eysenck). Since research has established that:

1. Aesthetic values correlate positively (Butcher, 1959) and factors Q_3 (Cortis, 1960.) and G. (Soloman, 1965.) correlate negatively with naturalism in education, we can assume that as scores rise on aestheticism and fall on Q_3 and G so scores on naturalism might be expected to rise.

2. Radicalism on the educational scales correlates positively and significantly with radicalism on the Eysenck Social Attitude Inventory (Butcher, 1959.), hence high scores on the latter would suggest high scores on the former.
3. Factors G and Q₃ correlate negatively with tender-mindedness (Soloman, 1965.) which correlates positively and significantly with aesthetic values (Butcher, 1959). Thus depressed scores on G and Q₃ will suggest high scores on tender-mindedness, as indeed will high aesthetic scores.

We assume, therefore, that these correlational relationships between students' scores and the N/I—R/C—T/T scales in education, will indicate that teachers in class contact with such students may be expected to score highly on all three educational opinion scales. Is this a justifiable assumption? Studies in the psychology of interpersonal behaviour in the classroom indicate that there is a cyclical relationship between teacher and pupil in which their acts are seen as interdependent, and this interdependence is affected by many variables of which mutual personality structure is one. For example, Argyle (1967, p. 173.) suggests that students like teachers more if they are, amongst other things:

1. Friendly, warm and fair.
2. Able to make contact with all students.
3. Stimulating, imaginative and energetic.

Might not (1) and (2) be equated with aspects of naturalism and tender-mindedness and (3) with radicalism, whereby one has to use experimental method to achieve stimulating and imaginative classroom technique? Foundation students therefore, tending to be aloof, withdrawn, undependable and poor at social interactions, will undoubtedly function more effectively when taught by teachers who score highly on each of the three dimensions of the educational opinion scales. Moreover the poor self sentiment which Foundation students possess means almost certainly that any concreteness (Harvey et al. 1966.) in teacher behaviour—i.e. fixed categorical beliefs married to authority rather than task concern—will encourage students to withdraw from the learning situation and will very probably intensify their lack of self sentiment and render the teaching ineffective. The very high scores on aestheticism which Foundation students achieved indicate the existence of a latent sensibility to grace, form, harmony and symmetry which only a similarly endowed teacher, with a tender-minded and naturalistic approach to art

education could be expected to understand. Similarly, high levels of somatic anxiety reflect not only the stressful situation in which Foundation students operate, but indicate also an ergic tension—or drive—which is a major component of the second order factor of anxiety. This tenseness, restlessness, impatience and anxiety surely demand contact with a tutor who has a sympathetic understanding and a genuinely personalised interest in the students' situation. Indeed the student combination of toughminded/radicalism and anxiety can lead to quite exhausting demands being made on Foundation staff, requiring such a teacher to be—in Getzel's terminology—ideographically orientated (i.e. person centred) rather than nomothetic (i.e. role centred). The Grammar School boy is being groomed to fulfil the role expectations of role senders and his teachers will thus tend to be idealist, conservative and nomothetically inclined. At Foundation level and to a lesser degree at Secondary Modern level, the student is in a diagnostic situation; in the former case tutors endeavour to maximise the student's individual potential to secure the optimum second year placement, in the latter case teachers hope to achieve a similar result so that leavers can enter employment which is most suited to their abilities. In both cases ideographic, naturalistic and possibly radical/experimental teaching environments are involved, and Otto Rank (1941) sums the situation up well: 'It (education) has to be told in terms of autonomy in the individual, the liberation and realisation of his potentialities'. From a series of rationalisations, therefore, we have predicted the direction which the educational opinions of teachers of Foundation students might be expected to take. It is opportune, then, to record teachers' scores and examine the significance of any trends which may appear.

6. RESEARCH FINDINGS

One hundred copies of the Manchester Survey were sent out to a widely distributed number of Foundation departments, and forty-eight replies were received distributed as follows:

Lincoln 7; Southampton 10; Exeter 3; Corsham 3; Liverpool 2; West of England 3; East Sussex 3; Salisbury 2; Bournemouth 7; and Mid-Warwickshire College of Art 8. Although the response rate of 48% was disappointing, thanks are due to those colleges and staff who did co-operate. The sample was considered 'in toto' and variables such as age, sex, subject, etc. were not considered independently. The mean scores have been recorded in conjunction with general scores of

Secondary School Teachers and Trainees reported by Pollock (1965), Cortis (1966) and Ward and Rushton (unpublished).

TABLE II

	No	Naturalism	S.D.	Radicalism	S.D.	Tender-mindedness	S.D.
Pollock	175	54.24	6.31	66.31	7.24	78.24	12.70
Cortis	259	58.12	6.41	73.74	6.55	80.72	11.74
Ward/ Rushton	61	59.30	7.3	65.20	8.4	77.10	16.7
Foundation	48	65.70	5.9	79.6	7.21	91.40	11.7

Table III records the magnitude of the differences between Foundation means and the recorded scores already referred to: and also their level of significance.

TABLE III

SIGNIFICANCE OF DIFFERENCES BETWEEN FOUNDATION STAFF MEANS AND TEACHER/STUDENT MEANS

	No	N		R		T	
		Diff	Sig	Diff	Sig	Diff	Sig
Pollock	175	11.46	C.R. 11.8 P < .001	13.29	C.R. 11.3 P < .001	13.16	C.R. 6.7 P < .001
Cortis	259	7.58	C.R. 8.1 P < .001	5.86	C.R. 4.7 P < .001	10.68	C.R. 5.8 P < .001
Ward/Rushton	61	6.40	C.R. 5.0 P < .001	14.40	C.R. 6.4 P < .001	14.30	C.R. 5.2 P < .001

On each of the three dimensions therefore Foundation teachers are seen to be very highly significantly different in their opinions about education, which supports the earlier assumptions made in this paper. Indeed, if we analyse the scores quoted by Pollock appertaining to Secondary Modern teachers only, we find the assumed trend discussed on page 135 substantiated.

TABLE IV

	No.	N	S.D.	R	S.D.	T	S.D.
Sec. Mod.	13	55.68	7.66	66.42	7.31	80.23	13.31
Foundation	48	65.70**	5.90	79.60**	7.21	91.40*	11.7

*P < .01

**P < .001

7. CONCLUSION

Within the limitations of this research, it would appear that Foundation staff are significantly more natural, more radical, and more tender-minded in their approach to the teaching of students, than Secondary School teachers in general, and Secondary Modern teachers in particular; and the different teaching ethos which is produced can have a profound effect on students transferring from school to college along the lines we have discussed. One wonders, therefore, in view of differences in staff attitudes, in student personality and attitudes, in the nature of the disciplines taught, and in relation to the lack of parity which Art Colleges experience, whether it would be wise to close Foundation courses, as has been suggested, and transfer to the schools the function of preparing students for a career in the Arts.

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DEVELOPMENT OF A SPECIAL COURSE FOR IMMIGRANT TEACHERS

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INTRODUCTION

The problems associated with the educational needs of Indian and Pakistani immigrant children in British schools have been given widespread publicity. The problems encountered by adult immigrants in seeking to enter the teaching profession in Britain, however, have received relatively little notice. Such publicity as immigrant teachers have received has tended to be adverse and there has been a strong tendency to think of immigrant teachers only in terms of the educational problems posed by large numbers of non-English speaking immigrant children.

The Department of Education and Science has for many years been concerned to find some way of tapping a potentially strong source of teacher recruitment and to provide the adult immigrant with a form of training which would equip him to teach in British schools. In 1966 the D.E.S. sponsored four pilot courses for immigrant teachers at the following institutions: Margaret MacMillan College of Education, Bradford; Whitelands College of Education, Putney; Wolverhampton College of Education; University of Nottingham Institute of Education. Each institution was asked to take 15-20 students, all of whom were required to have been recognised by the D.E.S. as having qualified teacher status. The exact number of Asian teachers then residing in Britain who would be eligible for recognition was not known but one estimate suggested that the number might be as high as 6,000. Of those who had been granted recognition only a very few were employed as teachers and a substantial number were known to be in employment which was in no way commensurate with their qualifications, previous experience and training.

Each course was to be of 15 months duration, a period of time which would be sufficient to afford every student one academic year of educational training plus one term of specialised English language teaching. The aim of each course would be to produce teachers of comparable ability to the average British probationary teacher. It must be emphasized that none of the courses was to be concerned with producing specialist teachers of immigrant children. The courses were quite deliberately designed to give a general training and the students were not encouraged to think of themselves as 'Asian specialists'.

Within these broad terms of reference, each institution endeavoured to provide a course which would enable its students to compete on equal terms for employment in British schools. What follows is an account of the first course given to Asian teachers at the University of Nottingham Institute of Education.

2. SELECTION OF STUDENTS

The selection of students for the Nottingham course, which began in September 1966, presented a number of difficulties. Without any advertising 50 firm applications and innumerable enquiries had been received by August of that year; all those who applied held the necessary basic qualification of being recognised by the D.E.S. as qualified teachers.

The applicants were graduates of Indian or Pakistani universities and the majority of them possessed higher degrees. Several were qualified in subjects, such as Oriental Languages, not normally found in the English school curriculum, but we did not feel that they should be disqualified on these grounds alone. A degree in Oriental Languages might not be considered a particularly useful qualification for one wishing to teach in a junior school but it could hardly be considered less relevant than a degree in many subjects commonly studied in British universities. To the difficulty of trying to evaluate academic qualifications and previous teaching experience was added the further complication of the lack of any suitable linguistic yardstick which could be applied.

Because of the extreme difficulty of making any rational selection from the applications received, and because the numbers involved were sufficiently small, selection was based mainly on the result of a personal interview. Eighteen students, of whom two were women, were selected for the Nottingham course which commenced in September 1966.

3. FACTORS GOVERNING THE DESIGN OF THE COURSE

The organisation and content of the course offered to the students was determined by a number of factors, the ultimate aim being that at the end of the course they should be of comparable quality to the average probationary teacher. No previous experience of running such a course existed. It was possible, of course, to draw upon experience of Asian students in other contexts and upon some experience of the kinds of problems they might have, particularly with regard to their linguistic difficulties, though these were not specifically related to classroom communication. There existed a certain amount of information of a 'popular' kind gathered from teachers and the press, concerning the failings of immigrant teachers. Most of the press reports were adverse and, although much of what was reported was rooted in barely concealed prejudice, such reports as were available were pursued with great care because such criticisms had gained fairly widespread currency. Almost all of the reported failings and inadequacies of Indian and Pakistani teachers were attributed to an insufficient command of the English language and, whether this were the truth of the matter or not, it was clear that all students would need an intensive course in English. The letters received from applicants went a long way towards explaining why so many had failed to reach an interview for a teaching post and it was clear that the problem was not simply one of spoken English.

The interviews were extremely valuable in confirming the need for linguistic improvement and in revealing the nature of a student's thinking on educational matters. It was clear that the two were inextricably linked and that as much of the immigrant's difficulty in communication could be attributed to *what* he was saying as it could to *how* he was saying it. It seemed not unlikely that many of the problems encountered by immigrant teachers in English schools were basically a result of failures of communication, not simply in the sense of speech sounds and patterns which could not be understood, but in the sense of ideas and attitudes which were irrelevant or meaningless in the context of a modern English classroom. The English programme, therefore, had to embrace both the mechanical and the situational aspects of speech.

Re-orientation of educational ideas and attitudes was absolutely essential if these students were to become successful teachers; upon this depended to a very large extent the success of efforts to improve both English and teaching techniques. To what extent it would be

possible to alter radically the thinking of mature students in 15 months was a matter for conjecture, but in all the courses that they took the fundamental aim was to exploit the flexibility of attitude which they had displayed at interview.

The students' understanding of the primary and secondary stages of English education was demonstrably confused and it was clear that the course, if it were to be meaningful, would have to provide all students with opportunities of gaining experience of both stages. It seemed that this would be essential, not only because it would provide some insight into the kinds of work done by children at different stages and the various teaching techniques employed, but because it would also help to give the students at least some knowledge of the cultural background of English children. It was not all clear at this stage for which age range individual students would be best suited and those who expressed a preference invariably did so for reasons which would not stand up to examination.

It would be necessary to provide these students with a course which would explain the present composition of British society, its social structure and the implications of this for education. It would be necessary to trace the more recent history of English education. What knowledge the students had of English society tended to be based on their contacts with English people at work or in the vicinity of their homes. Though these contacts varied quite considerably, the deprived area environment loomed large, with the result that the students had a somewhat distorted vision of the values of English people and the role which our schools play in fostering certain of these.

Method courses as such would take second place to the more fundamental task of basic re-orientation and would arise out of this work rather than be imposed upon a superficial grasp of principles underlying British education. Against what was felt to be the needs of these students and, therefore, the shape that the course should take, had to be set the resources of the Institute of Education and the availability of teaching practice facilities in the area.

4. RESOURCES AVAILABLE

The author was responsible for the course and was engaged full-time in its organisation, in teaching English, in supervision of teaching practice and in all personal tutoring. All other members of

the academic staff of the Institute were also involved in some way in the teaching of these students.

The Institute had approximately 90 full-time and 130 part-time students, all teachers of some experience in English schools, following courses leading to Advanced Diplomas in Education. The courses offered to these teachers would have been of little value to Asian teachers with no experience in English schools, and we were quite unable to use them as part of this special course. The Institute did not itself offer any courses of initial training for teachers, and, therefore, did not possess the resources, in terms of equipment or a large specialist staff, to be found in a College of Education. These students could not have been fed into an existing structure supplemented by additional courses (in English for example) to meet their special needs. As mature students they might be thought to have had considerably more in common with the other students of the Institute than with students undergoing initial training but, in terms of experience of the British educational system, they clearly had less background than either of these groups.

Although the 90 full-time students were pursuing Advanced courses and had no direct link with the immigrant teachers, they represented a very powerful indirect resource of the Institute in that their maturity and experience provided the immigrants with an invaluable source of constructive help through informal contacts.

Schools in Nottingham and in the immediate vicinity are subject to extremely heavy demands for teaching practice places as a result of the enormous amount of teacher training concentrated in the area. In consequence, local education authorities expressed themselves very willing to help but were limited in the extent to which they could do this by established promises of places to other centres of teacher training. This meant that it was not possible to hand pick schools, although the authorities involved did their best to avoid schools known to present special problems for student teachers. Greater selectivity might have been enjoyed had our students travelled further afield; this would have meant their taking up residence away from Nottingham for the duration of a major teaching practice, however, and because accommodation problems for these students were very acute, it was felt that it would be unfair to require them to seek alternative accommodation halfway through the course. In the event, it proved possible to offer our students teaching

practice facilities which probably compared favourably with those offered to most other students undergoing teacher training.

5. ORGANISATION AND CONTENT OF THE COURSE

The course resolved itself broadly speaking into four main areas:

- (a) the improvement of both written and spoken English,
- (b) the study of English educational practice,
- (c) the study of contemporary British society,
- (d) practical teaching.

These, obviously, are labels of convenience which do not aim to describe or define, in any but a very general sense, the content of the course.

The organisation of the study of these areas was governed by three main factors:

- (a) the belief that English studies should be continuous throughout the course and should proceed in conjunction with, and not in isolation of, the students' other studies;
- (b) the belief that the study of English educational practice would be a largely sterile pursuit unless the students were given a practical context in which to evaluate the theoretical claims;
- (c) the need to arrange teaching practice periods so that the major practice would fall in the third term of the course, thus allowing time for any necessary extensions or 'rescue operations' to be carried out in the fourth term.

The pattern that emerged from these considerations formed the organisational basis of the course as follows:

Term I—a period of concentration on the primary school.

Term II—a period of concentration on the secondary school.

Term III—partly preparation for, and largely the execution of, a major teaching practice with the age group of a student's choice made in the light of experience gained in terms I and II.

Term IV—a term which was left largely unplanned until a later stage in the course when the needs of individual students could be more clearly assessed. This was reserved for any extra teaching practice that might be required, for a number of visits to schools and institutions of special or particular interest and for individual programmes of work.

It was probably in the sphere of curriculum studies and teaching practice that the students were able most clearly to identify their needs and their areas of inadequacy for work in English schools, and

much of the course took the form of a direct response to their requests for help. Music, Drama, Art and Craft were unknown to all but one member of the group who possessed a western qualification in music. Lecturers from local colleges of education came to give courses in these subjects, gearing their courses to non-specialist students and placing great emphasis upon the making of simple but effective visual aids. A local junior school headmaster, especially interested in the difficulties his student encountered in blackboard work, gave an after-school course for any interested students and established a very successful group who studied methods of teaching Writing. An urgent request for a basic course in Nature Study came after only a few visits to junior schools and a local teacher came in to give a term's course on the common flora and fauna of the British Isles.

All students followed a course in mathematical education which dealt with the problems of mathematical concept formation, the uses of structural and other apparatus, the use of the environment for providing mathematical activities and some of the more recent mathematical content introduced into school curricula. The approach adopted was through the use of the materials by the students themselves followed by a discussion of the kind of learning that had taken place.

All students attended practical science sessions where they could see the sort of work undertaken in a primary school and its integration with other parts of the curriculum. This was always followed by a discussion of how this work contributed to the aims of a primary school teacher. During the second term students went on to see how science, through practical sessions, could be taught to emphasise discovery and invention in the secondary school. This approach, not extreme by British standards, was obviously very surprising to most of these students; it served to emphasise the difference between the role of the teacher in Asia and in Britain. There was, at first, a marked reluctance to touch the material and it was some time before students could be persuaded to use it. Increased familiarity with the material, however, made most students more confident both in their own ability to use it and in the possibilities of using apparatus on a class scale.

During a course of lecture-discussions the students were introduced to some basic concepts of spoken and written language in the context of education. The nature of symbolic representation was

discussed and, in the light of these discussions, methods of teaching Reading and Number at the early stages were considered in more detail.

Another primary course dealt with the characteristics of primary school children and the nature of individual differences, and considered curriculum changes in primary education and the development of methods of teaching the basic skills of Reading, Arithmetic and Writing. Some emphasis was placed here on the problems of the slow-learner and students were introduced to the testing of reading ages (grading books according to reading and interest ages), reading schemes, graded series, supplementary readers and apparatus. They discussed the merits of formal and activity methods, and the meaning of such terms as 'child-centred' and 'subject-centred'. The not unimportant matter of differences between theory and practice was also discussed.

The History of Education was approached via the 1944 Act and involved considerations of the various stages of education, the advantages and disadvantages of breaks at various ages, the concept of comprehensive education and the variety of systems in operation at the present time.

An introduction to contemporary British society was given by a member of the University's Department of Sociology who, in addition to considering the various strata of society and the values and attitudes of these groups, also considered their significance for the teacher and the meanings of such concepts as 'freedom', 'authority' and 'responsibility' in this context.

All students were given a course in Psychology which outlined the experimental approach to the problem of the child undergoing the process of education and the experimental analysis of that process. The course included lecture-discussions on the problems of learning and the development of personality and intelligence. Emphasis was placed on the empirical research which has provided the rationale for certain features of British education which are most strikingly different from the forms to which the students were accustomed.

The general area of Philosophy of Education was reduced to a course concerned with ethical, moral and social considerations. It was designed to introduce the students to some of the general principles which operate in this field and, in particular, it raised specific social problems of a moral nature with which many students might expect to come into contact in the schools. At the same time

particular situations were discussed in terms of the general fundamental ethical and moral principles involved.

A short course was given as a general introduction to certain aspects of classroom management with specific guidance on situations which might well arise during teaching practice.

In addition to the work done by visiting lecturers from local colleges of education, the students were encouraged to use the workshop facilities of the Institute to make their own visual aids, and in this they received a great deal of help from the other students of the Institute. Some of the science specialists attended method courses given to P.G.C.E. students in the University and a group of Geographers/Historians attended a local college of education for similar courses.

During the first and second terms about 50% of the timetable was devoted to improving the students' command of English. This involved sessions in the University language laboratories, discussions, talks, written English, etc. A great deal of the discussion time was spent reinforcing points made in other sessions and in dealing with various queries and problems arising out of time spent in schools.

The students were mostly very keen to attend the various in-service courses organised by the Institute and to attend the innumerable special lectures given by visitors to the University. They involved themselves to a considerable degree in activities of the Students' Union, particularly in sport, and in various hall activities, all of which provided more discussion material than we ever had time for. They displayed a considerable faith in the miracle-working properties of the language laboratory and expressed great distress at the thought that they would have to miss these sessions during the full teaching practice. It was quite impossible to attribute improvement in English to any one activity but the students clearly felt that it was the language laboratory that was responsible, and many put in a great deal of extra time there.

During the first term each student spent one day per week in a junior school. This pattern was repeated in a secondary school in the second term, and the last seven weeks of the third term were devoted to a full teaching practice. By extending the terms it was possible to offer each student a total of 13 weeks in schools during the course. Assessment of a student's ability to adjust to the demands of the British school situation was continuous and was based on course work and teaching ability.

6. RESULT OF THE COURSE

Seventeen students completed the course in December 1967 and were established in posts in January 1968, ten in secondary and seven in junior schools. One student temporarily withdrew from the course because of ill health and completed it three months later; this student did not enter the Education Service as a teacher but secured employment as an Education Welfare Officer. The 17 have now been teaching for just over two and a half years and a survey, carried out in June 1969 by Miss H. E. Richardson of Nottingham University, revealed that 16 of the teachers had passed the probationary requirement and that the other one was at that time still awaiting assessment.

There can be little doubt that these teachers encountered more difficulty in obtaining suitable employment than the average probationary teacher. They formed a mature and highly motivated group, anxious to succeed but often lacking self confidence. Where they have been able to gain experience in reasonably sympathetic and encouraging situations (and even in a few cases where they have not received such support) they have mostly shown themselves to be professionally competent and capable of effective teaching in British schools.

BOOK NOTICES

DAVID WARWICK, *Team Teaching*. (University of London Press Ltd., 1971, £1-50; 80p. paperback.)

TEAM teaching, as a pattern for the organisation of a school or a subject department, is becoming of increasing importance in current educational practice and those looking for a useful primer on a variety of its aspects will find David Warwick's book helpful. It is concerned exclusively with the secondary school and, as is bound to be the case in any book presenting team teaching in general terms, is a little short in practical detail about what actually goes on in the classroom. This is accentuated by the style which is objective and balanced making this a useful handbook of a number of much discussed educational ideas but one which does not fill the reader with any great enthusiasm. In addition the absence of a composite bibliography is more than a little annoying and makes it difficult to follow up references; the sections at the end of each chapter on further reading are helpful individually but not easy to use for reference purposes and this unfortunate quirk of arrangement diminishes the value of the book as a serious permanent contribution to the literature of team teaching.

However Mr. Warwick's demonstration of the value of this method of organisation, his elaboration of its philosophy and educational justification and, above all, his models for inter-departmental team teaching schemes will be found of the greatest value. He also deals well with a number of practical problems: the grouping of pupils, the structuring of teams, the keeping of records and the numerous other related small but important details through inattention to which so many team teaching schemes have eventually foundered. It can therefore help teachers to avoid elementary mistakes which might otherwise kill off an interesting experiment before it had really got started.

The book has been very fully researched and a feature of particular interest is the large number of plans of actual school environments for team teaching which it reproduces. For some readers, indeed, this may be its main value as we come increasingly to understand how the environment can affect the kind and quality of teaching in a school. New ideas in secondary school building could be the pace-makers in curriculum change and the development of teaching method in the next 20 years and teachers, whether students or those of some experience, will find much assistance here in dealing with newly developing situations.

David Warwick's book can be recommended as a straightforward, unpretentious and wholly adequate elementary introduction to its subject.

ANTHONY ADAMS

WILBUR ZELINSKY. *A Prologue to Population Geography*, (Prentice-Hall, 1970, 80p.).

POPULATION geography is rapidly becoming a major branch of human geography and its study has an inherent appeal to the general reader as well as the specialist. Professor Zelinsky's introductory volume has now been issued as a European edition, coinciding with its adoption as a set book for the Open University social sciences course. The author approaches the study of population as an autonomous branch of geography, and in the first part of the book he discusses the nature, subject matter and boundaries of population geography. The second part offers a broad explanation of the distribution of the world's population in terms of economic and cultural factors. In the third part, which occupies more than half of the book, Zelinsky discusses the socio-economic evolution of mankind, analyses the relationship between population and resources, and examines the correlation of population data with other information as a means of defining population regions.

This book is really a framework for study rather than a reference volume. Zelinsky provides the reader with a concise introduction to the subject without overburdening him with factual detail. Although the text is illustrated with a series of informative maps, the reader has to wait until the penultimate chapter for a protracted discussion of some specific examples of the population regions he has been shown how to define. In view of the fact that the author's aim is to formulate a general approach to the study of population, it is curious that he omits any reference to the construction of demographic models in geography, interest in which is currently being shown on both sides of the Atlantic. Since the book does not assume a specialised knowledge of population geography, it is a useful introductory text for undergraduates and B.Ed. students as well as for those following the Open University course. Its usefulness will greatly depend, however, on the reader's access to the large and growing amount of literature on the subject, particularly the works cited in the numerous footnotes and in the annotated bibliography.

DAVID J. BOARDMAN

GEORGE Z. F. BEREDAY (editor), *Essays on World Education* (O.U.P., 1969, 65s, paperback 24s).

FOLLOWING the enactment of the International Education Act of 1966, President Lyndon Johnson had the idea of calling an International Conference on World Crisis in Education to Williamsburg, Virginia. The conference met between October 5-9, 1967 and assembled some 150 delegates from all parts of the world. Professor Bereday then undertook the task of

editing papers which had been specially prepared to be read at the conference to form the substance of this book, and also had the happy idea of publishing as an appendix the guidelines and recommendations which were formulated as the deliberations ended. It is a pity, however, that he thought neither of providing an index nor of giving the credentials of those whose papers are published—even though a number are of international fame and thus well enough known already.

As is only to be expected in such a compilation the papers are of uneven quality. Torsten Husén makes a valuable and sanely practical contribution in his essay on 'School Structure and the Utilization of Talent'. In his contribution on 'Educational Resources and Productivity' Friedrich Edding emphasises the need to remember that 'the input/output relation in education is, however, essentially different from that of industry'. Frank Bowles treats of the 'Democratization of Educational Opportunity' in his well-known low-tone but all the more persuasive manner. R. Freeman Butts is topical and thought-provoking on the necessity to modernize teacher education. And Bereday himself contributes an impressive overview of 'Schools Systems and Mass Demand', pertinently reminding us that the present crisis in education 'cannot be alleviated simply by restructuring systems of education'.

Writers contributing to the second half of the book were invited to make some appraisal of education in specific areas of the world. Of these, Philip Idenburg gives a masterly summary of Europe's search for new forms of education. There is an interesting stock-taking exercise by Clark Kerr on education in the U.S.A. Problems of Asian education are wisely treated on a symposium basis. The problems of Africa and Latin America are fairly presented by Arthur T. Porter and Gabriel Betancur-Mejia respectively.

The recommendations contained in the appendix for 'enlarging' education (as the editor quaintly puts it) strike one by their matter-of-fact and non-Utopian quality. Some serious heart-searching certainly went on at the conference. The vital necessity for sensible international cooperation is repeatedly stressed, and comparative educationists will be relieved by the rider that the aims of education in any given country must, however, 'be determined only by the country itself'. The necessity for more relevant research is emphasised. There is insistence on the growing importance of non-formal education. To sum up, there is recognition throughout that, whilst our most urgent problems might seem to be economic, it would be wrong to consider economic development as the only or over-riding problem.

VERNON MALLINSON

RICHARD SYMONDS (editor), *International Targets for Development* (Faber and Faber, 1970, 50s, paperback 25s).

PERHAPS the greatest service this collection of essays renders the educationist is that it proves a timely reminder of the famous dictum of Sir Michael Sadler that 'things outside the school matter even more than the things inside the school, and govern and interpret the things inside'. All the contributors to this book are either present or former officials of the United Nations and its specialised agencies and they have, generally speaking, held closely to the terms of their original briefing: to discuss the kind of targets which can be envisaged for economic and social development in the seventies and prospects of reaching them. The overall impression gained by your reviewer however is that with only one or two notable exceptions the civil service mentality dominates, the author carefully (sometimes almost primly) never committing himself to any clear-cut or definitive line of action. This impression is again fortified (rather than dispelled) by the monotonous reiteration at the beginning of each chapter that the views expressed are personal to the author in question. Again, a few of the contributors seem uncertain of the kind of reader they are supposed to be addressing and manifest a lamentable tendency to talk down to him rather than take him fully into their confidence.

Yet despite these strictures (which I have preferred to get immediately out of the way) this book does make an important contribution to our thinking and planning for the years ahead. Perhaps I may be forgiven for suggesting that the chapter by Philip H. Coombs on 'A New Strategy for Educational Development' seems to be the most dynamic and positive in its approach, and that on 'Man and his Environment' possibly the weakest — though I fully appreciate the difficulties with which the writer had to contend. Halvor Gille on 'Population' is sound though saying little new. Zammit-Tabona reiterates in a persuasive manner essential growing points in 'Health Aspects of Development'. The remaining chapters on 'Food and Agriculture', 'Trade', 'Aid and Investment' and 'Minimum Living Standards' adequately highlight difficulties and put the general reader (which here includes your reviewer) firmly in the picture. David Owen's exhortative concluding chapter 'A Combined Strategy' does not seek to minimise the difficulties which lie ahead and wisely warns against 'defeatist conclusions and reactionary policies'. The book is competently indexed and includes a very necessary table of the many abbreviations of international agencies in current usage.

VERNON MALLINSON

J. S. COLEMAN (ed.), *Education and Political Development* (Princeton U.P. and Oxford U.P., 1970, 620 pp., paperback 30/-).

It is good to have a paperback edition of this excellent collection first published in 1965. Most of the contributions have, if anything, gained in validity and topicality since, and Professor James Smoot Coleman (not to be confused with James Samuel Coleman of *The Adolescent Society* fame) is to be congratulated afresh.

He himself sets a high standard of analytical rigour and perceptiveness in his lengthy Introductions, particularly those to the book as a whole and to Part I on 'Patterns and Problems of Educational Underdevelopment', and while it is quite invidious to single out just a few contributors for the readers' attention, the present reviewer found the papers by F. X. Sutton, A. H. M. Kirk-Greene, and Bert F. Hoselitz especially interesting and illuminating.

Coleman regrets the 'uncritical transfer of the educational philosophy and structure of metropolitan countries to their colonies', but notes also among native intellectuals 'suspicion of any divergence from the British pattern' as threatening dilution of standards; hence the slowness of the revision of the curriculum in the direction of greater practicality, indigenisation and politicisation. There is support for his views in Sutton's discussion of 'Education and the Making of Modern Nations' when he points out that in, say, Africa 'much of the matter of the school curriculum was unsupported by experience outside the school', and yet how the desire to fathom 'the secret of their [i.e. the colonisers'] power' would attract even anti-western Asians and Africans to western education. Kirk-Greene, drawing on his experience as both civil servant and academic in Northern Nigeria, readably analyses 'the tension-areas that appear when an alien but indigenous bureaucracy, predominantly selected by merit and trained along contemporary civil service lines, comes into contact with an established and largely heredity-conscious native administrative hierarchy'. And Hoselitz examines the political difficulties and social pitfalls of using education to promote speedy economic growth, and warns as 'that in much of the current discussion on economic impact of education and the need for educational planning in developing countries . . . especially non-industrialised sub-Saharan ones . . . too flat a transference is made from the European past and present to the African and Asian future'.

The whole collection is organised along four dimensions: educational underdevelopment, polity-oriented educational systems, elite education in new nations, and the politics of educational planning; while geographically the range of contributions is world-wide, from China to Brazil. Last but not of least value comes a 25-page annotated bibliography of the subject, prepared by K. I. Rothman.

The relationship between education and the polity as two major social institutions, even though its study began with Plato, has not yet been much explored. As empirical researchers in this country begin to burrow at the grassroots of 'political socialisation' (cf. recent articles by Dowse and Hughes in *Sociology*, Vol. V/1, 1971, or by Dennis, Lindberg and McCrone in the new *British Journal of Political Science*, Vol. 1/1, or by Stradling and Zurick in *Sociological Review*, 1971), it should be particularly useful to be able to set their findings in the wider context of analytical studies such as those making up the present volume.

R. SZRETER

CORRECTION

We regret that a passage of David J. Boardman's review of FRONTIERS IN GEOGRAPHICAL TEACHING which appeared in our last issue was printed incorrectly. The passage should read as follows.

The review of geography in British schools has also been brought up to date and contains references to the revision of syllabuses by some examining boards in an attempt to give pupils an opportunity to think originally instead of relying heavily upon memorized factual information. Consideration is also given to the role of model theory in reconciling the idiographic and nomothetic approaches to geography. The trends which are discussed in this volume are so fundamental to the teaching of the subject that it deserves to be read by every practising geography teacher.

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SCHOOL OF EDUCATION
UNIVERSITY OF BIRMINGHAM

THE QUALITY OF THINKING

in secondary school subjects

Edited by
E. A. PEEL

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THE QUALITY OF UNDERSTANDING IN SECONDARY SCHOOL SUBJECTS

EDITED BY E. A. PEEL

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SCHOOL OF EDUCATION
UNIVERSITY OF BIRMINGHAM

CHAPTER I

UNDERSTANDING SCHOOL MATERIAL

by E. A. PEEL

Professor of Educational Psychology, University of Birmingham

- (i) What is understanding
- (ii) Its revelation in the act of explaining
- (iii) The place of concepts in understanding
- (iv) Modal and substantive concepts
- (v) The structure of understanding
- (vi) The change in quality of understanding over adolescence

(i) *What is understanding*

Although it may not be often stated as a fundamental aim, improvement in the quality of understanding is nonetheless an important objective of the new secondary school curricula. In this number of *Educational Review* we have collected a few researches from several aimed at investigating how the power of thinking, together with the attendant improvement in understanding, develops over the secondary school years. Apart from the last paper, concerned with the promotion of thinking generally, each presents material relating to a specific school subject. These papers include studies of thinking in science, history, geography, mathematics and religion.

Understanding is a much used word with so many meanings as to engender great confusion and to lead some specialists to avoid using it altogether. This, however, is not true of most teachers who may have recourse to it in every teaching day. From the ubiquity of its usage, we may tease out a few meanings of the term 'understanding' which have significance in relation to secondary school study.

First take the case where a person has to follow instructions in order to reach a desired goal. Such might be how to reach a destination by car, how to obtain a good picture on the television, how to do button-hole stitching, how to make a cake, or how to carry out an experiment in elementary science. In each case, after the mode of

procedure has been drawn up and described, the instructor checks with the question. Do you understand what you have to do? In such circumstances the word *understand* merely relates communication with doing. It does not necessarily imply understanding the principles involved in each skill, but whether the sequence of operations required has been learned.

Next consider a passage in a history text or piece of descriptive geography setting out, say, the events leading up to the 1914-18 war or the pattern of agricultural activity in the Burgundy region. Such material puts before the reader a sequence and pattern of cause and effect relations. These may be of varying degrees of multiplicity and remoteness and may include short- and long-term influences. When we ask the questions, Do you understand the text?, it implies: Can you follow the sequence or pattern of causes and effects? Here there is no question of turning words into actions, but the learner has to be able to envisage actions, conditions and intentions and relate them to their consequences. Understanding history, geography, current affairs, literature, and biography implies a grasp of cause and effect, a capacity to follow a sustained argument and a power to evaluate.

Thirdly we have understanding in science and the application of the laws of science to explain fresh phenomena. Examples would be the understanding of the behaviour of light upon reflection, refraction and diffraction, or the progress of chemical reactions on the functioning of genetic transmission. There would also be applications of scientific understanding to problems, say, of physical geography or of putting a satellite into orbit. Such understanding entails referring the particular problem to more general concepts and laws (relationships between concepts) established previously and independently of the particular problem before the thinker.

Fourthly we may mention briefly what is implied in mathematical understanding. Foremost it includes insight into the formal properties of such acts as counting, measuring and grouping and then the ability to conceptualise these properties. Lastly, it includes the capacity to utilise these ideas in deductive lines of thought.

Fifthly we have to consider briefly what we mean when we ask: Do you understand what this French sentence means? At this simple level, understanding means relating a new language or set of signs with the entities and acts they signify and is basically no different from the idea of understanding as being able to follow and give

(when the pupil can speak French) instructions relating to actions. However, we may also ask the question: Do you understand French? and this involves linguistic ingredients as well as semantic references and shares in a sense with mathematical understanding in the grasp of the formal properties of the language.

Lastly we may include aesthetic understanding which involves a sensitivity to elements of pictorial, sculptural, musical and literary form and to the purpose of the creators of works of art in these fields. Appreciation of form can be described in perceptual and intellectual terms. Insight into the artist's aim is more subjective, for communication between artist and viewer or listener implies selection by both parties, creator and appreciator. Often this selection is intuitive and scarcely conscious. This provides the variety and richness of artistic appreciation but it also makes it nigh impossible to generalise about this aspect of artistic sensibility.

(ii) *Its revelation in the act of explaining*

These few comments on the nature of understanding cover much of what is expected of the idea in secondary school studies. In the papers which follow, accounts are given of the development of understanding in different areas and so some of the above meanings will be brought out. How is this done? By presenting the pupil with a partially open problem situation and calling for an explanation or judgment. The test unit is composed of two parts. First a statement of an action, event or phenomenon, and secondly a question beginning with the word Why . . . ? So the measure of understanding is the quality of explanation the thinker is capable of producing. Let me give two instances from research carried out in the earlier phases of our programme which we shall not be able to discuss later. First there is Lodwick's (1958) application of Piaget's technique for assessing moral judgment to intellectual problems. After giving a short paragraph setting out the story (apocryphal?) of King Alfred and the cakes he asked the question: Could Alfred cook? Here are some explanations given which reveal an increasing maturity of understanding of the anecdote:

Answer A: Yes (Why?) Because he's the King.

(Can every King cook?) No.

(Why could Alfred cook?) Because he can fight.

This answer reveals fragmented thought. One aspect of the situation is focused upon and refers to concrete material; hence his combined

statements often contain inconsistencies. It also reveals that maturity of thought is a factor in understanding.

Answer B: No (Why not?) He forgot all about the cakes. He was a man and that's why he couldn't cook as well as a woman does. A woman is a proper cook.

Although this answer is primarily at a restricted logical level, it shows signs of power to co-ordinate relationships.

Answer C: I shouldn't think so, at least not very well. He didn't pay attention to the cakes, if he had been a cook, he might have known they'd been done.

The problem has been judged at the concrete level in terms of the content—burning the cakes. Therefore, Alfred could not cook. The relationship that Alfred was thinking about the Danes has been excluded.

Answer D: I don't think so, because if he could have cooked, he'd have known how long it takes them to bake. (Are you sure he could not cook?) I've never heard that he could cook. Kings are supposed to have servants for that. You couldn't be sure. I wasn't born in his time.

The answer is slightly more mature for, although he is still under the dominance of the content (his first sentence), he can hold several relationships and he does go beyond the content to his own experience.

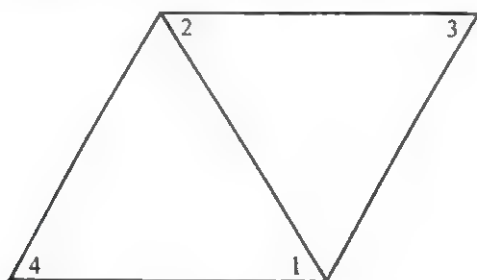
Answer E: No I don't think so, because in the olden days the King didn't have to know how to cook at all. It's like today, he has servants to wait upon him. If he could cook, he would know approximately when cakes were done. He was thinking about the Danes but some instinct would have told him, if he could cook, when the cakes were done. We can't really tell.

This explanation shows that the thinker is able to judge the statements formally and logically and is not put off by their content. Thought is said to be reversible, resulting in consistent argument. Hypotheses are examined systematically.

Repeatedly in studies of children's understanding, we find that much immaturity is caused by over-dependence on the concrete, visual, material aspects of a problem, with an attendant deterioration effect on their understanding of the essential formal relationships of the problem. The understanding by middle secondary school

pupils of geometrical problems, whether definitions or riders, well illustrates these difficulties; Saad (1957, 1960) investigated the mathematical understanding of 14-16-year-old grammar school pupils and recorded many instances of errors due to the distracting effect of irrelevant diagrammatic clues or to taking a spatial picture instead of a mathematical concept. These illustrate how the visual appearance of geometrical figures could prevent the pupil from making a correct formal judgment. Thus to the question:

'If angle 1 = angle 2, angle 2 = angle 3, and angle 1 = angle 4, we can conclude that angles 3 and 4 are equal. Upon what principle is this conclusion based?' supported by the following diagram:



39 per cent of the 14-15 year olds and 31 per cent of the 15-16 year olds gave the explanation

'The opposite angles of any parallelogram are equal'.

When asked to state the meaning of a circle, 22 per cent of 14-15 year olds and 14 per cent of the 15-16 year olds gave a static spatial picture: a round figure, a curved line, a line round a point on a uniformly curved line, a line with no ends, a line enclosing a space.

It is a matter for some comment that 22 per cent of middle grammar school pupils recognise a circle not as a mathematical concept, but from some spatial aspect. Such a response is not an explanation but a mere description of its perceived features.

In summary, two things may be stressed. Offered explanations provide a clue as to the quality of understanding. Understanding involves not only a comprehension of the perceptual content of problems, and their systematisation as concepts, but also intellectual rigour seen in following and developing logical and causal sequences.

(iii) *The place of concepts in understanding*

From our list of different meanings of the word understanding, it

may appear that concepts, as generalisations of experiences, are not uniformly necessary in the act of explaining. The first instance of following a rule of procedure may not seem to evoke conceptual thinking at all. In the second meaning, of following cause and effect sequences which link events, the arguments may be grasped without recourse to conceptual activity in the sense required in the understanding of physics. Some people might deny that it is possible to extract generalisations from the raw material of social studies. But whilst such a point of view can be reasonably maintained, there is another sense in which the use of concepts must enter into all kinds of understanding.

The schoolboy scientist has to know what a beaker is, the car driver taking directional instructions has to know what is meant by left and right, turnings and traffic lights. When such terms are used and understood in speech or writing it is likely that the concepts of these objects or relations are also known.* The same is true of reading a history text. The reader will not get very far before he meets a word which symbolises a concept. All verbs and adjectives indicate concepts and many of the nouns.

We assume then that wherever we turn in the school curriculum we encounter concepts.

(iv) *Modal and Substantive concepts*

It is possible to make a provisional grouping of school subject concepts into two sets. As a practical device, such a division may help us to realise that some ideas seem common to most subjects, whilst each subject also has its own specific concepts. Let us begin by noting a difference between two extreme kinds of concepts of use in school learning.

First there are those concepts which emerge from the substance and material subject matter of the specific subjects making up the curriculum. We may select as examples the concepts: in physics, of force, friction, heat, adiabatic and isothermal expansion; in chemistry, metal, element, salt, paraffin, and reaction; in geography temperate region, mediterranean climate, erosion, trade; in history, nobility, treaty, revolution, dictator; in languages, sentence, subject, predicate, metaphor, stress; and in mathematics, sum, product, power, angle, point.

*The only occasions when concepts may not be involved are when the instructor carries out an actual ostensive demonstration and the learner imitates or follows him.

Such concepts are derived from experienced phenomena, some of which constitute instances of the concept evolved, others which do not. For instance, in forming the concept of the force of gravity, the phenomena of freely falling objects, or those rolling and sliding down inclined surfaces, the forces required to raise objects from weight lifting to elevators, and space rockets, all contribute positively, whereas the forces necessary to move objects horizontally in a straight line or curved as in swinging an object around one's head, or those in magnetism and chemistry and combustion, are experienced as non-instances of the concept of gravity.

These above instances possess a marked common property, group of properties, as in the case of heat and mediterranean climate, or a constant relationship between entities, as in Boyles Law (a constant relationship between the temperature, volume and pressure of a gas) and tangent (a geometrical relationship between a straight line and a curve). The thinker is able to express, formulate and communicate these common features which characterise each concept in terms of appropriate language, either native or special, as in mathematical and chemical language. Invariably when once it is formed the concept is identified by a name or symbol so that it enters the currency of communication.

Such concepts originate in the noting and enumeration of experiences and any common characteristics they possess. They come to form the subject matter of the particular school study concerned. Since they derive from the specific substance of each study, I shall call them *substantive* concepts.

At the other extreme, there are certain basic concepts which we appear to arrive at from more general, ubiquitous and longstanding experience. They are often formed first in early childhood, and they are fluid and subject to development as we grow more experienced. They include: being and not being (extending to the later concepts of instances and non-instances and positive and negative features), substance, quantity, time, space, change, growth, balance, consistency, causality, action, reaction, cancellation, compensation.

We may note two features of such concepts. They systematise the very basis of the way of looking at ourselves and our world, and thinking about our existence. Secondly, their formation and acceptance in the mind of the learner, however implicit, is necessary *before* he can form the more specific substantive concepts arising from material experience. Each of the substantive concepts listed on the

previous page subsumes one or more of these more basic ideas.

Such ideas, therefore, have a *modal* and *structural* quality and I shall refer to them as such. We should note however, that there is interaction between substantive and modal concepts, that although, say intuitive, biological, introspective ideas of space and time are required to form concepts of distance, movement, velocity, these latter concepts themselves lead to deeper understanding of space and time.

In many ways this development by interaction between substantive and modal concepts constitutes the main flow of the curriculum.

This discussion has brought out differences between two extreme kinds of concepts. But in between there may lie a continuation ranging from the concept of specific disciplines, to the most fundamental concepts associated with humanity's basic reactions to its environment.

In the papers which follow, the concepts invoked are principally of the substantive kind, since by adolescence most modal concepts necessary for their understanding are already established.

(v) *The structure of understanding*

Of course there is much more to understanding a school study than the formation and application of its concepts. These latter are themselves organised into a hierarchy, beginning with the modal concepts, leading to central concepts, often then combined in defining assertions, as for instance that $\text{force} = \text{mass} \times \text{acceleration}$, to produce more specific ideas. Very often there are also involved empirical laws, as in Boyle's Law in physics, where certain concepts are linked in a certain discoverable empirical way. Finally, as emphasised at the end of section (ii), all understanding calls for logical rigour, whether in following cause and effect argument, or in testing out hypotheses against here and now events. Recognition of this complexity is implied in the various quality categories chosen in the following studies to label the degree of maturity of understanding revealed in the explanations offered. They may appear somewhat unsystematically, but we may now have reached the position where in future investigations we might isolate these different aspects of understanding and list them separately.

(vi) *The change in quality of understanding over adolescence*

When we turn to investigate differences in the quality of adolescent explanation and understanding, our first task is to produce test material capable, at the highest level of answer, of evoking conceptual and causal thinking. Without being pretentious, we may say we want to challenge the imagination of the ablest and most mature pupils and students, so that they will look for explanations and bases of judgments beyond the actual material used. We assume at first that the main dimension of judgment is along the line from mere unimaginative description to explanation in terms of invoked concepts and ideas calling for imagination and try out. After applying such material, finer differences may emerge.

We have used verbal material consisting of short passages called for comprehension, short problem situations in science and mathematics and demographic statistics and charts in the human sciences.

Preliminary work indicated that at least three clearly marked points on a line of explanation might be kept in mind in drawing up the problems and questions. At the lowest level logically immature individuals tend to answer tautologically, to be put off by irrelevances, or to deny premises or other conditions of the problem.

At the next level the thinker is dominated by the content of the material and seems unable to look outside it.

Finally at the highest level of answer, the thinker realises he has to go beyond the content of the passage to evoke possible hypotheses from his own experience.

I have already reported in detail on the method, its findings and possibilities, (Peel, 1971). Generally, mature judgments implying the interplay between the *possible* and the *actual* do not appear to be predominant until after about 13½ years of age. Sometimes, as shown by de Silva and Law in their papers, mature understanding may not appear until 15 and 16. Even among college students there appears to be a sizeable minority whose understanding is dominated by content. The thinking of the 11 to 13 year old pupil appears to be mainly in terms of the actual—even when such material is manifestly partial and insufficient for solving the problem.

Beginning with a fairly limited capacity to offer explanations in terms of single pieces of circumstantial evidence, the thinker is gradually able to coordinate several such elements in the problem situation and finally he is able to see these as elements in a system of balance which is disturbed by human action, and he is able to

imagine possible courses of action open to the person to establish the balance and at the same time produce the results he wishes.

The establishment of a technique that brings out a noticeable range of explanations, capable of meaningful analysis, with evidence that these judgments can be independently assessed similarly by different assessors and that test material of equivalent basic logical qualities and semantic structure evoke fairly consistent levels of response from pupils and students, enables us to proceed to examine factors which might enter into the emergence of different levels of judgment.

These factors could stem from differences in the passages: whether partially or more fully informative, or whether they referred to situations familiar or not so familiar to the thinker, as shown in social or non-social material. The form of questioning could also play a role: as, for example, whether it is open or multiple choice. Finally, there are several factors arising from differences in the pupils' make up and background.

These may include: age, sex, intelligence, personality (stable-neurotic, extravert-introvert), language attainment and usage, psychological adjustment and maturity. More on the environmental side we need to consider socio-economic differences, interests, attitudes, prejudice, instruction, schooling and education. The influence of some of these factors has been investigated and by using analysis of variance techniques and designs it has been possible sometimes to examine several of them together.

Summing up, we note overall the significance of the ages of thirteen to fourteen in the noticeable appearance of good quality thinking, but we may also draw attention to its susceptibility to environmental and educative influences, shown in improvements due to familiarity of setting (in social passages), socio-economic level of parents, formal instruction in how to think, and leading answers as provided in multiple choice forms.

The significance of the ages of thirteen to fourteen in the development of comprehension and judgment must be recognised and allowed for in the teaching of adolescents. But it must also be seen against the setting of secondary school education as we know it in the Western World.

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CHAPTER II

THE FORMATION OF HISTORICAL CONCEPTS THROUGH CONTEXTUAL CUES

by W. A. DE SILVA

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I. INTRODUCTION

ONE of the declared aims of teaching history could be achieved by any means other than a proper understanding of the subject matter of history, which not yielding itself to easy experimentation or inspection compels both teacher and student to depend very heavily on language in communicating and acquiring historical knowledge.

Peel (1967, p. 166) refers to a possible major source of confusion in studying history. It would arise when 'new concepts with new unfamiliar names are introduced into connected texts and are not well defined in the process'.

In studying secondary school history, the conceptions of political and economic theory keep on constantly cropping up and they present difficulties for the immature pupil to grasp. A child's vocabulary is very limited and the words that signify these conceptions do not communicate very much. If their referents are not fully and properly explained confused and chaotic thinking is bound to result, making historical imagination impossible.

Quite apart from adequate definition and exemplification Peel (1967, p. 171) shows that there are 'other barriers to understanding caused by more involved factors', namely the initial absence and subsequent slow growth of qualities of thinking including rational thought and logico-structural process.

The only basic psychological research undertaken in this direction is the study by Werner and Kaplan (1952) on how children reached the meaning of words embedded in sentences. This pioneering study by Werner and Kaplan can be said to be only partially successful in bringing into the open the developmental aspects of the acquisition of word-meanings. The capacity to attain word-meanings cannot be

said to operate alone by itself. It should depend to a great extent on the qualitative growth of the general thinking capacity. It does not appear that Werner and Kaplan in their study have fully explored the possible connections between the various stages in the acquisition of word-meanings and the growth of logico-abstract thinking.

2. THE PRESENT STUDY

The present study was undertaken to investigate the processes by which adolescent students ascribe meanings to coded words standing in for historical terms, going on contextual cues alone. A word-context test consisting of ten passages was administered to 160 students taken in equal proportions from those receiving selective and those receiving non-selective education in England. The subjects were also differentiated by age, the range sampled being from 12 to 16 inclusive.

The passages test was designed so as to carry one artificial word embedded in each passage. The subject reading the paragraph is expected to arrive at the meaning of the artificial word. Each of these artificial words signifies an economic or political conception arising in the learning of secondary school history. Here is one passage used in the research:

Artificial word: MALMIR (slump—depression)

The years that followed the victory of Waterloo were some of the worst that Britain ever passed through. The 'false and bloated prosperity' of the War, as Cobbet called it, gave way to a terrible malmir. The Government no longer needed to buy huge quantities of munitions and clothing for the army and the Allies; the people of Europe after more than twenty years of war, were too poor to buy the goods that British manufacturers would have liked to sell; instead the foreign governments often used their discharged soldiers to make their own goods.

The testing procedure was basically the same as that adopted by Werner and Kaplan. The subject was informed that he would be presented with ten words which he never heard before; that these words were used in a little island many thousands of miles away and were not spoken anywhere else; and that these ten words would be presented to him one at a time, each embedded in a paragraph. The interviewer concluded: 'I want you to try to find out what each of these words mean'.

When faced with the task of comprehending the meaning of an unknown word embedded in a passage, subjects either made no

response at all or made a response falling into one of four types which were identified as follows:

- Logically restricted responses
- Circumstantial conceptualisation
- Logical possibilities
- Deductive conceptualisation

It is only at the stage of deductive conceptualisation that a subject is able to deduce the correct meaning of the unknown word from the cues available.

3. ANALYSIS

(i) *Logically restricted responses*

These immature responses are not oriented to reality but are tautological, inconsistent, directly contradictory, irrelevant or otherwise irrational and display a gross lack of comprehension of the passage. The subjects responding in this category seem to be put off by irrelevances both of form and content. The responses often take the form of casual irrelevant guesses or bizarre responses.

The following example illustrates this category of response in respect of the aforementioned passage.

Malmir: It meant a terrible disaster to the people of Britain, it gave way to a terrible disaster as it would say (Age 13). This and other similar responses seem to be solely dependent upon one single word occurring in the context, sometimes immediately preceding the unknown word.

(ii) *Circumstantial conceptualisation*

This form of signification is characterised by attempted solution in terms of one aspect of the presented data and failure to grasp the essential features of the problem. It is an attempt at understanding based on a single piece of evidence picked out from the context supporting a simple unqualified response. Subjects do not show signs of being able to use many of the material cues given and are content with making very limited trivial responses.

The following examples illustrate this category of response in respect of the aforementioned passage:

- (a) It is a disease, because the soldiers that came back from the war might have brought back diseases with them (Age 14)
- (b) I think it means disaster, because the government was poor and after a war you can't come out all that prosperous after having to fork out a lot of money (Age 15).

- (c) I think it is a famine, because all the money had been spent on guns and ammunitions. Therefore there was no money left to pay for the goods (Age 14).
- (d) Poverty, because they did not have any money after fighting the war (Age 14).
- (e) Malmir means loss, because the people of Europe were too poor to buy the goods.

(iii) *Logical possibilities*

In this category of response subjects engage in realistic appraisal showing capacity to combine two or more pieces of evidence and ability to relate cause and effect. Possible alternatives and competing solutions are offered and possible explanations invoked. One sees here the beginnings of comprehensive exploration of the material taking account of more than one factor, as well as of generality, abstraction and penetrativeness.

The following examples illustrate this category of response in respect of the aforementioned passage:

- (a) 'The word 'malmir' means hardship. I think this is so because of the fact that the government couldn't sell our goods, and the countries that bought off us before now couldn't afford our goods or they now made them themselves, so Britain became a poor country (Age 15).
- (b) Uprising, if Britain could not sell what the manufacturers had made then some men might be out of work. The army would not be needed for fighting and so they might get sacked. The people of Britain might think that the government had done nothing to try and improve the situation and go against the government (Age 13).
- (c) Redundancy, I think so because it said that Europe was too poor to buy things that Britain made because of twenty years of war. Also it said that European people used to make their own clothes (Age 13).
- (d) Unemployment, because with the factories having been turned into munition factories they could no longer send trade to other countries who found other sources to get the products and with mass unemployment because of the men coming back from the war and the closing of the munitions factories (Age 15).
- (e) Poverty; when the people from the munitions factories were discharged from it they had to find jobs elsewhere and this was hard to do. The shortage of jobs meant a rise in unemployment and poverty (Age 16).

(iv) *Deductive conceptualisation*

In responses falling in this category the subject generally explores the content of the passage in almost its entirety in a deductive way and draws integrated and reasoned inferences taking account essentially of the problem. The primary characteristic of responses in this category is the deductive reasoning or sustained argument

from the basis of assumed hypothesis resting on general rules or principles developed inductively or deduced analytically. The following instances illustrate this category in respect of the aforementioned passage:

- (a) Depression, this is probably so because after wars etc. the government no longer needs to buy stuff and many men are unemployed so leading to a general depression of industry etc. (Age 15).
- (b) Slump; after most wars the extensive munitions factories close down or are converted to make cycles and other items like this. So many people lose their jobs which they held during the war. Secondly a large amount of soldiers returning home from the war need jobs and there is not the demand in industry to create places in factories for ex-soldiers; so a slump occurs (Age 16).
- (c) Depression, the country was in an awful state. They had been promised better wages etc. but they were denied all these privileges. After the war had finished, the country was therefore in a slump of industry as men were no longer needed to produce weapons of war (Age 16).
- (d) Depression, after any war there is some sort of depression, as many new industries formed during the war were out of business when the war finished; thus many people were out of work (Age 15).
- (e) Slump, after the war Britain found it could not sell the stuff it could before the war as other countries took over the market in other countries. This made industry poor. The word 'slump' fits in place of 'malmir' as this happens to most countries after the war (Age 16).

4. RESULTS

The responses were evaluated and classified by a panel of six judges including the writer and a sufficient level of agreement among the judges was established statistically.

Table 1 shows the frequency distribution of different response categories between grammar school and non-grammar school subjects in respect of all 10 passages.

TABLE 1

Frequency of different response categories in two types of subjects

Category of response	Grammar school (N = 80)	Non-Grammar school (N = 80)	Total
No response	35	62	97
Logically restricted response	394	544	938
Circumstantial conceptualisation	118	76	194
Logical possibilities	62	30	92
Deductive conceptualisation	191	88	279

A Pearson X^2 test was carried out to test the null hypothesis that the two attributes, type of subject and category of response are independent. It was established beyond the .001 level of confidence that a statistical association does exist between the two attributes. Non-grammar school subjects make a high proportion of logically restricted responses while grammar school subjects show a high proportion of instances of deductive conceptualisation.

Significant differences also exist in the frequency distributions of response categories among the five age groups tested, logically restricted responses decreasing and instances of deductive conceptualisation increasing, with age. Table 2 shows the number of responses falling in each category given by subjects of each age group in respect of all the passages.

TABLE 2

Frequency of different response categories in the five age groups

Category of response	Age 12 (N = 20)	Age 13 (N = 40)	Age 14 (N = 40)	Age 15 (N = 40)	Age 16 (N = 20)
No response	8	14	26	38	11
Logically restricted response	142	275	252	189	80
Circumstantial conceptualisation	20	37	42	62	33
Logical possibilities	9	24	17	35	7
Deductive conceptualisation	21	50	63	76	69

The chi square for significance of difference among all age groups came out significant beyond the .001 level. The different age groups were next taken two by two and the corresponding chi-squares computed. The results of all these tests are summarised in Table 3. The entry in each cell relates to the result of the chi square test for significance of difference between the age group represented by column and the age group represented by row.

TABLE 3

Results of tests of significance of pairwise differences among composite age groups

Age group	13	14	15	16
12	N.S.	N.S.	P.001	P.001
13		N.S.	P.001	P.001
14			P.001	P.001
15				P.001

On this statistical evidence it seems clear that there is no real difference among the age groups 12, 13 and 14 in regard to the number of responses of different categories. However, there is a significant difference between each of the age groups 12, 13 and 14 on the one hand and each of the groups age 15 and 16 on the other. Also a significant difference exists between the two age groups of 15 and 16. The breaking point is seen to lie between the ages of 14 and 15.

The data were next examined separately for the pupils receiving selective and non-selective education respectively.

Non-selective education pupils

The chi square for significance of differences among all age groups was significant beyond the .001 level. The different age levels were next taken two by two and the corresponding chi squares computed. The results of all these tests are summarised in Table 4. The entry in each cell relates to the test of significance of difference between the age group represented by column and that represented by row.

TABLE 4
Results of tests of significance of pairwise difference
among age groups—Non-grammar type

Age group	13	14	15	16
12	N.S.	N.S.	P.01	N.S.
13		N.S.	P.001	P.05
14			P.001	P.05
15				N.S.

Once again the breaking point is seen to fall between the ages of 14 and 15.

Selective education pupils

The chi square for differences among all age groups was significant beyond the .001 level. Next chi squares were computed to test the significance of all pairwise differences and Table 5 summarises the results. The entry in each cell relates to the test of significance of difference between the age group represented by column and that represented by row.

TABLE 5
Results of tests of significance of pairwise differences
among age groups—Grammar type

Age groups	13	14	15	16
12	N.S.	P.05	P.001	P.001
13		P.001	P.01	P.001
14			P.01	P.001
15				P.001

In an attempt to locate the point at which the precise break occurs two more chi squares were computed, taking groups of age levels collectively, namely

- (a) Age levels 12 and 13 against age levels 14, 15 and 16
- (b) Age levels 12, 13 and 14 against age levels 15 and 16.

Both these chi squares are significant beyond the .001 level. However, on the strength of the magnitude of the chi square it may be said that the dividing line between the age levels of 14 and 15 is more marked and definite than the dividing line between the age levels of 13 and 14.

4. DISCUSSION

The scheme of classification evolved here is very strikingly similar to Peel's scheme of levels in the upward progression of thought to explainer thinking. Peel's main categories of thought both as regards their respective characteristics and the total evolutionary order find confirmation in the present analysis.

The evidence from this study may be taken as strongly supporting Peel's (1967, p. 165) assertion: '... much of school history is taught through texts and new words are often introduced for fresh ideas and institutions mainly through contextual passages without a precise definition being given. This makes for erroneous concepts.'

Peel (1965, p. 178) succinctly points to the crux of the problem as follows: '... the child can receive real information by such means only if he is in a state where he can understand this information. This state requires that the new information is presented in a form demanding not more than the structure of action which the child has already formed. The child will make of the information what he can by virtue of his particular level of development—but this may not be what the adult intends. Hence the so-called discrepancy between language and thought.'

The problem may be specially present in connection with history texts written with the 'style' and not simplicity, uppermost in mind, as in a particular work where the author (left unidentified here) in the Preface writes: 'Although in general, the limitations of the youthful vocabulary have been kept in mind throughout the book, there has been no attempt to write in mono-syllables for the illiterate, a course which would have been bound to destroy all style and with it all interest.' The assumption here that the interest of the student

is directly related to the verbose professional style of the author is, to say the least, highly debatable.

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CHAPTER III

GEOGRAPHY AND THE ADOLESCENT

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I. THE GEOGRAPHICAL BACKGROUND

GEOGRAPHICAL analysis and interpretation at school level is focused primarily upon the study of man in relation to his environment (Scarfe, 1971). If children are to make a realistic appraisal of human activity within a spatial setting, it follows that a secure basis of concepts and skills must be established before they can go on to analyse, interpret and explain, the interaction of key elements within diverse environmental contexts.

An intensive fieldwork approach is now widely favoured as a means whereby geographical knowledge and understanding can be cultivated through direct exploration and discovery (Everson, 1969). As an essential foundation and continuing core of study, fieldwork can certainly offer much that is valuable educationally. Most secondary schools, however, range far beyond the local environment to conduct an extensive survey of the earth as a whole (Graves, 1971). Since children are called upon to examine territories which stand outside the bounds of direct personal experience, such a programme of study will inevitably give rise to certain attendant difficulties within the classroom situation.

1. In the absence of direct environmental contact pupils will have to interpret evidence presented in verbal, pictorial, cartographic or statistical form.
2. The pupil will have to orientate himself spatially within the appropriate environmental context, and take into account all the relevant factors whether they arose out of the local, the national, or the global situation.
3. The pupil will have to take note of the local decision-taking situation in the light of the knowledge, the material resources, and the preferences of the local inhabitants.

4. Finally, the factors thought to be significant will have to be interrelated to support a comprehensive explanation.

Considered in terms of Piaget's developmental psychology each of these requirements would constitute a task beyond the child's intellectual capacity prior to the period of adolescence.

1. Prior (1959) has shown that 9 and 10 year old children cannot readily interpret maps in the absence of a direct link between their concrete experience and the displayed information. Even photographs cannot be analysed to an adequate degree without disciplined experience and careful training (Long, 1961). Since pictures form a two-dimensional representation of a three-dimensional reality, it is argued that children must learn to utilise such material symbolically, in order to suggest the concepts and ideas drawn from real life (Vernon, 1962).

2. At first the child is able to orientate himself spatially in terms of direct practical action. Later he is able to structure that area which he has experienced at first hand, in a representational form, involving the coordination of known landmarks within an overall reference frame of his own construction (Piaget, *et al.*, 1960). But, when the child is asked to make a systematic analysis of cartographic material, related to an environmental context which cannot be experienced directly, he is faced with a cognitive challenge of a different order. An investigation into the nature of the 'mental map' held by children of an area greater than that which they knew intimately through frequent contact, revealed that it was not until 13+ that they could contend with spatial distributions organised within an abstract frame of reference (Blair, 1964).

3. 'Decision-makers operating within an environment base their decisions on the environment as they perceive it, not as it is' (Brookfield, 1969). Human choice and action in distant parts of the world cannot be explained, therefore, without some reference to the appropriate cultural orientation. This is a sophisticated task that can confound even the skilled adult geographer. The pre-adolescent would be further handicapped by limited experience, and his limited reasoning capacity. The complexity of adult behaviour in the distant past, raises a comparable problem in history, where mature judgments are rarely expressed prior to late adolescence (Peel, 1967; Hallam, 1967).

4. The experimental investigations of Piaget and Inhelder (1958) into the powers of reasoning employed by children at different age levels, when confronted by scientific problems, have shown that an ability to deal with problems involving several elements or variables, does not come about until late adolescence. The characteristic qualities of formal-operational thought are only acquired gradually over several years, and it is unlikely that children can employ hypotheses to organise their explanations, as opposed to mere description prior to the age of 13+ (Peel, 1965; 1968).

The gradual emergence of a capacity for formal-operational thought is thus seen to be critical. In an attempt to distinguish successive levels of maturity of judgment within the overall framework of development, a set of geographical case-studies based on the criteria outlined above, were designed for presentation to a group of children spanning the age range 9 to 16 (Rhys, 1966).

2. THE INVESTIGATION

1. *The Subjects*

The children who took part in this enquiry numbered 120 in all (C.A. range 9.8 to 16.3 years; M.A. range 8.6 to 17.6 years). The details are as follows:

- (a) 100 pupils were in attendance at a large urban secondary modern boys' school. Twenty were selected from each year group (years 1 to 5), evenly distributed between the 'A' and 'B' streams.
- (b) 20 pupils were selected from a nearby junior school, and covered a cross section of ability in the top two years.

The mental ages of each of these pupils were obtained from the Simplex Group Intelligence Test and Raven's Progressive Matrices.

2. *The Experimental Material*

Before a satisfactory format could be contrived a pilot-study was carried out with a limited, though representative, group of children. The study units finally selected focused attention on five major themes where the problems raised would be meaningful for the area under consideration.

1. Soil erosion in an Andes valley.
2. Masai migration in East Africa.
3. Commercial grain-growing in Manitoba.
4. Intensive rice-cultivation in Japan.
5. Crofter farming in the Outer Hebrides.

Spatial remoteness was deliberately emphasised in each case, so that contact with reality was dependent upon transmitted information. The necessary data was conveyed by means of prose passages (problems 1 and 4), maps (problems 2, 4 and 5), photographs (problems 3 and 4), and statistical tables (problem 5). Provided the children could comprehend and interpret this material, it would be possible for them to identify significant elements, note key relationships, and achieve a reasoned explanation. The questions asked focused attention upon basic issues, in order to crystallize reasoning, and to compel interpretation in terms of the dominant factors operating within each problem situation.

3. Procedure

The problems were conducted on a group basis, except where the use of photographs compelled an individual presentation. It was never convenient to work through more than two problems on any given occasion, due to the length of time required. All details of the test material were checked through with the children before a single question was put. Each question was stated in a standardised form. During the individual sessions supplementary questions were employed as required to clarify any apparent ambiguity of response.

3. RESPONSE ANALYSIS

For the purpose of analysis each problem was taken in turn, and the responses to each question were examined as an independent sequence. Responses were grouped together into categories or sub-categories whenever they conformed to a recurrent pattern, which appeared to constitute a significant stage in the overall sequence of development.

The general pattern of analysis initially applied to each response sequence was as follows:

1. An inability to comprehend the environmental context under review, where answers involved tautology, irrelevance and denial of premises. The questions were frequently related to personal experience and individual preferences, with scant consideration given to the reality of the situation.

2. A descriptive analysis conducted in terms of the presented data with gradual recognition and discovery of the essential features of

the problem-situations. There was a gradual progression from unqualified inferences dependent upon circumstantial evidence, to a more adequate analysis where the children made use of concepts and generalisations standing outside the presented data to qualify or extend their answers. This very broad category embraced such a wide range of responses that it had to be subdivided. In particular, a fundamental distinction emerged between those who focused on an isolated piece of evidence, and those whose answers combined several relevant factors.

3. Here there was a difference of form dominated by variations on the following verbal pattern.

'If he/they did/did not undertake a certain course of action, then a certain result would/would not follow.'

Although this category could be identified at the first analysis for 10 out of the 12 response sequences, it could not be sustained as an independent category, either statistically or by the quality of judgment expressed, and it had to be fused with the most mature level of response present in category two.

4. A more sophisticated and elaborate analysis organised in terms of a positive judgment, assertion or hypothesis, to which the available evidence could be related to substantiate the general argument.

Once a response sequence had been analysed on this basis, the responses were placed in rank correlation related to chronological age, and to the mental ages derived from the two intelligence tests. Each sequence was then checked by an independent judge. The resultant correlation coefficients ranged from 0.95 to 0.98, and thus granted a high degree of reliability to the response analyses. The significance of difference between successive pairs were then calculated for each sequence. Where the derived critical ratios threw doubt upon certain of the final gradings, they were carefully reconsidered, and whenever it seemed wise to do so categories were combined.

The problems posed by the various case-studies differed in their complexity and level of difficulty. Although the final, consolidated, response sequences inevitably reflected this variety, four major response levels constantly recurred as a consistent underlying pattern (Table 1).

TABLE I

Major response levels
(approximate age-levels given in months)

Category	C.A.	M.A. (Raven)	Principal features
1	up to 132.0	up to 144.0	Not reality orientated
2	148.6	156.6	Single piece of evidence; reality orientated
3	156.6	168.6	Limited deductive analysis; items of evidence combined
4	168.6 and upwards	180.6 and upwards	Deduction from a guiding hypothesis; comprehensive judgment

Two major variants within this general pattern are worthy of note:

(i) It was occasionally possible to subdivide category two (Table 3). This usually applied when a problem was presented on an individual basis. When questioned further some pupils could not develop their first limited response. On the other hand, others could sustain the direction of their response, and qualify or extend the answer first given. This distinction was normally masked when a problem was presented on a group basis.

(ii) Where a sub-division of category four could be sustained (Table 2). This applied when a genuine difference in the quality of response occurred, related to an extension or refinement of the general argument.

4. GROWTH IN THE MATURITY OF JUDGMENT

In contrast to the findings of Carpenter (1955) and Lodwick (1958) the results of this research displayed a closer relationship between the successive levels of development and chronological age, than with mental age. The only exceptions to this general tendency appeared to arise:

(a) Between categories one and two, where the degree of comprehension displayed was inclined to fluctuate.

(b) Where category four was sub-divided. Here the significant difference between successive category levels depended more on mental than on chronological age.

In an attempt to assess the relative importance of chronological as opposed to mental age, in relation to the development of thought, the final tables of analysis obtained for each of the response sequences

were considered as a group. The correlation coefficients between the categories of development and the mental ages were then calculated, also those between the categories of development and the chronological ages. Chronological age was then tested for significance against the mental ages derived from Raven's Progressive Matrices, producing a *t*-value of 2.35. Secondly, chronological age was tested for significance against the mental ages derived from the Simplex Intelligence Test, producing a *t*-value of 5.18. In each case the resultant difference proved to be greater than the 5% level of probability.

Consequently, the general implication is that in terms of these problems the development of thought between the concrete-operational level on the one hand, and the level of hypothetico-deductive reasoning on the other, would appear to be more a function of chronological age than of intellectual maturity. This would seem to support Peel's argument that where the successive levels of thought are defined in terms of their qualitative differences, then mental age which is a measure of quantity rather than quality must, to some extent, be reduced in value 'as a criterion of growth against which to test the real temporal setting of Piaget's sequence of thought growth' (Peel, 1970, p. 177).

5. AN EXTENDED ANALYSIS

Within an environmental context a process of dynamic interaction is at work, involving a complex of physical, social and economic forces, where all the active elements are modified over time. Geographical analysis is not related to a static situation, but has to take note of a balance of forces which is liable to change, at times approaching a state of equilibrium, at others propelled into a state of flux by some qualitative change in the total structure.

The capacity to think in terms of 'dynamic balance, involving the potentiality of action, its cancellation and possible compensation by other action', does not apparently emerge until middle or late adolescence (Peel, 1965, p. 162). The adolescent's emergent capacity to contend with equilibrium-disequilibrium situations in geography can be examined by reference to some of the response sequences derived from this enquiry. The resolution of the associated problems and their explanation is directly related to a qualitative advance in the pupil's level of intellectual functioning, and the achievement of equilibrium in a personal sense.

1. *The Masai*

This problem made use of a single map to display the essential information. The map showed that the tribesmen moved their cattle twice yearly from the north-west highlands to the base of the Rift valley in the south-east. Shading indicated that the highest land had permanent water-holes and nearly 50" of rain per year, whilst the valley floor had an annual rainfall of under 20" and temporary water-holes. Arrows indicated a migration pattern tied to the heaviest rainfall periods (March-June; October-November), with movement to the valley in February and September, and a return to the highlands during July and December. The children were then asked why the Masai followed this seasonal pattern of movement.

An effective explanation would require some understanding of the extant state of dynamic equilibrium, in which the key variables (i.e. the areal and the seasonal distribution of rainfall) are inter-related on a cyclical basis to conserve the essential supplies of water and forage.

Most of the youngest children responded concretely to the dominant piece of visual evidence, namely, the area of heavy rainfall above 7000 ft. The 50" total was considered in isolation as a hazard ('Because . . . it would flood them'), to be offset through flight. It was evident that they could neither interpret the data meaningfully, nor consider the situation as a whole. Isohyets, like contour lines, are essentially abstract concepts expressed in symbolic form. Such material has to be interpreted at the conceptual level, whereby past learning and experience can be related to current perception.

Successive categories were more realistic, where responses were based on a descriptive analysis of the material evidence. There would be a serious attempt to relate the sequence of movement to the seasonal pattern, followed by a deduction derived from this sequence, e.g. 'they move therefore one month before the rainfall'. It was widely assumed that the possibility of flooding could be cancelled out through careful anticipation and suitable avoiding action. The fact that each area has its heaviest rainfall at the same time was ignored, and a constructive reconciliation of the underlying causative factors was not possible.

Only at the most mature level of response could the children detect and interweave the controlling variables as an integrated whole. There is now a change of form as well as a carefully reasoned reconciliation of the factors upon which the contrived state of equilibrium

is dependent. Instead of following the data on a descriptive basis, a hypothesis is put forward based upon reasoned scanning of the evidence available, prior to manipulating this data to substantiate the argument.

e.g. The Masai migrate twice a year . . . to get the best seasonal rainfall they can . . . (movement details). . . The reason why they keep moving is that the waterholes in the valley are non-permanent, but the waterholes in the highlands are. Another reason for their task is that when they are in the valley using the grass and water, the grass and water in the highlands is building up. This means that when they return to the highlands, the water and food is there for them. This method keeps repeating.

It is worthy of note that whilst every response placed in the fourth category showed deduction from a guiding hypothesis, only 11 pupils were able to break free from the 50" rainfall fixation and achieve an undistorted judgment (Table 2).

TABLE 2
Masai Migration Problem
Ages given in months

Response category	n	C.A.		M.A. (Raven)		M.A. (Simplex)	
		m	o	m	o	m	o
1	27	132.6	10.4	137.2	14.9	147.4	18.3
2	21	143.3	11.3	150.5	13.5	166.0	15.2
3	25	158.5	9.9	170.3	17.7	175.1	12.2
4i	36	179.0	10.4	186.6	19.9	185.7	13.5
4ii	11	181.7	7.5	205.2	16.6	197.0	10.8

2. *The Prairie Farmers*

A self-sufficient economy, as pursued by the Masai, can be considered as a closed system. But, where regional specialisation is pursued within an expanded trading system, as exemplified by the prairie farmers (unit 3), the part cannot be judged effectively if examined in isolation. The area selected for study was located on a map of the Canadian farming regions, and a set of oblique aerial photographs conveyed the essential features of the local economy. Most of the critical issues arose from a study of the first plate, which showed a small market centre surrounded by an apparently endless plain.

The children were first asked: 'Is it wise for the farmer to grow one crop only over such a very large area?'

The apparent conflict between the amount of land available and the deliberate concentration on a single crop, could only be resolved

by reference to marketing and locational factors not directly attributable to the observed physical conditions. Alternative possible outcomes had to be invoked, where the economies of scale and farming efficiency might compensate for the risks attached to the controlling mode of action.

Two distinct trends were evident in the qualitative advance from the least to the most mature level of response.

(i) Egocentric answers gradually gave way to an objective appraisal of the total situation. At first human convenience was considered to be sufficient justification in itself and environmental constraints were ignored. Second level judgments were content biased, though expressed in propositional form, embodying an assumed link between the solitary element seized upon and the pattern of land-use under consideration (e.g. that the flat plain favoured mechanisation). Responses placed at the third level remained descriptive in form, though the complementary balance of cause-effect relationships were now made explicit. Thus, the profit held to accrue from mass-production could only apply 'if there's a demand for it'. Finally, at the upper level, a co-ordinated degree of deductive analysis could be derived from a carefully balanced judgment, culminating in a firm conclusion.

e.g. Normally, No. For something could easily go wrong with the crop in a particular year, and they would lose everything. But . . . a great demand for it would be necessary before they can grow on a scale like this, and they need transportation to get it away to the world market.

(ii) This objectivity of judgment turns fundamentally upon a clear understanding of the scale of the enterprise under consideration. Many of the younger children responded perceptually to the visual evidence of space without being able to discern its geographical significance. The obvious immensity of the plains shown in the photograph did indeed provide the vital key, but only if it could call upon ideas and concepts previously acquired and independently formed to demonstrate the significance of the observed concentration on a single crop. The pupil has to be conversant with the advantages that can be derived from a concentration on a single product within the framework of international trade.

The cumulative advance in the pupil's cognitive organisation of space and his conception of relative location, could not be inferred directly from the responses made to the first question. The under-

lying pattern became quite explicit, however, when the children were asked:

'Why has this small town grown up just here, where the main road and railway cross each other?'

Two major sources of difficulty were revealed by the responses made by the younger children.

(a) They were unable to interpret and interrelate the information conveyed within the frame of the photograph.

(b) They regarded the area encompassed by the picture to be discrete and self-contained, unrelated to the larger area of which it formed a part.

The resolution of this degree of spatial confusion can be traced across five successive levels of response (Table 3).

(i) The youngest children simply could not structure the spatial field under examination, and advantages were granted to the town's site that could apply equally well to any point on this uniform and monotonous landscape.

e.g. 'Because the land is flat and they build on flat land usually.'

(ii) By 11 years of age both the landscape and human action could be organised within the photograph's frame of reference, in terms of the perspective granted by the camera.

e.g. 'It would be situated in the middle and have the same amount of land on either side.'

(iii) At 12 years the camera's viewpoint is no longer held to be paramount since the town can be regarded as the destination for the crop produced by each individual farmer. The town is viewed from the standpoint of each farm within the portrayed scene, and the children are at least partially successful in coordinating perspectives from a point-of-view set within a situation wholly detached from personal experience.

e.g. 'Because you can get the wheat here by road and rail, and seeing as how the railway goes straight through it can pick up all the wheat from the farms.'

Whilst this particular segment of space could now be related to an extended spatial plane, the area shown could not be located with complete certainty until the children could call upon external evidence to place the local area within an abstract frame of reference.

(iv) By about 13½ years the answers given made frequent reference to the Great Lakes, the St. Lawrence river, ocean transport and the British market. Thus the observed area could now be related to an extended spatial framework, through the use of landmarks culled from the reference map, or knowledge gained from classroom tuition.

(v) Finally, at 14½ years and above, the pupils displayed a secure grasp of the overall spatial context governing local action, and could relate this prairie area to the wider spatial framework of Canada as a whole, and the world beyond.

A realistic judgment was not possible, therefore, until the children could rationalize the interrelationship of the observed phenomena within the projective setting provided by the camera, and build this discrete segment of space into an extended Euclidean construct. It is considered that these closely related requirements are dependent upon the application at the formal-operational level, of those concepts of projective and Euclidean space, which would have been formed earlier at the concrete-operational level (Rhys, 1972).

TABLE 3
Prairie Farmers' Problem
(Question 2: Town Location)

Response category	n	Ages given in months					
		C.A.		M.A. (Raven)		M.A. (Simplex)	
		m	o	m	o	m	o
1	16	128.1	8.4	133.4	17.4	142.5	19.6
2	14	131.7	12.7	144.7	14.1	161.8	17.7
3	21	150.2	9.5	152.2	13.9	163.8	12.2
4	36	163.4	13.7	173.5	15.9	173.8	14.8
5	33	181.6	10.1	194.9	22.2	192.7	12.9

6. CONCLUSIONS

The distinctive features that characterised the major category levels (Table 1), could be detected quite readily in each and every response sequence, even where the problem situations involved a time-related shift of equilibria (i.e. problems 1 and 5). Although this underlying pattern was consistently present it is evident that the various response sequences varied in detail. A comparison of Tables 2 and 3 is sufficient to indicate that the number of responses placed at each level differed from question to question. The answers given by individual children tended to fluctuate between one level and

another when checked across all twelve response sequences, apart from a limited number who were stabilised either at the first or at the fourth level. What remained invariant was the qualitative sequence of advance from the least to the most mature level of response.

The resolution of geographical problems, through a process of explanation, would seem to require objectivity on two distinct planes. First, in terms of spatial orientation, where some combination of projective and Euclidean concepts has to be employed at an abstract or symbolic level. Secondly, in terms of cultural orientation whereby due attention is paid to local capacities and traditions when appraising the local decision-taking situation.

At the most mature level of judgment attained by the children engaged in this enquiry, whatever constituted the environmental context under review could be organised as a whole from the outset. These older pupils were able to structure and organise the total spatial field, and effectively interweave the component variables, either within a self-contained unit (e.g. problem 2) or within the context of a more extensive and elaborate structure (e.g. problem 3). At this level human action could be evaluated objectively and critically, where judgments took into account the technical resources and expectations of the local population, and the restraints imposed by their environment as they perceived it. The achievement of equilibrium with respect to symbolic representations of unencountered 'worlds' would seem to be critically dependent upon the emergence of a capacity for hypothetico-deductive reasoning.

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CHAPTER IV

THE GROWTH OF MATHEMATICAL THINKING DURING THE SECONDARY SCHOOL YEARS, WITH PARTICULAR REFERENCE TO PROBLEM SOLVING

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I. PURPOSE OF ENQUIRY

THE purpose of this enquiry was to investigate the ways in which boys of different ages tackled a variety of mathematical problems, some of which were related to school work while others were entirely outside the scope of a normal teaching situation. It was thought that, with increasing age and mathematical experience, the older pupil would have a distinct advantage. Further, the onset of adolescent (formal) thinking might be expected to show itself, both in a greater control of techniques and in a greater flexibility of approach and perseverance. It was also possible to compare the performances of different mathematical 'sets', and to compare 'quick stream' pupils (attempting 'O' level in four years) with others. Some interest attached to the method of 'talking-out' which was adopted, and to the thought processes which were thus demonstrated. The results suggest that success in problem solving is most clearly related to overall ability and intelligence, and that increasing age and greater mathematical learning give less marked advantages than might be expected.

2. INTRODUCTION

'The origin of thinking is some perplexity, confusion, or doubt. Thinking is not a case of spontaneous combustion, it does not occur just on general principles. There is something specific which occasions and evokes it' (Dewey, 1910). This comment, stated in general terms here, is applicable to mathematical thinking in particular, in which activity the proper objects of such thought are quantities, relations and abstractions. Thinking takes place when we meet a

problem and accept the mental challenge which it offers: hence the importance of the 'problem' in a mathematics lesson to introduce a new topic or to test understanding.

Problems have always played a part in the teaching of mathematics, as indeed they have often been the starting points of mathematical enquiry. Early in school life a child draws a distinction between the 'problem' and the 'mechanical' aspects of arithmetic, and may experience difficulty in finding out how many threepenny stamps may be purchased for six shillings even though he could quite easily perform the mechanical operation of dividing 72 by 3. The 'problem' in fact may be that of translation from the verbal content of the question to the well drilled arithmetical process which is to be used, or it may be that of understanding the language in which the question is phrased. It may be suggested that with practice such difficulty may be overcome; what may be a problem now will become merely a routine exercise next week or next year. An increase of mathematical knowledge or expertise or maturity may enable a problem to be brought within the range of those things which are done efficiently because they have become automatic. It is necessary, therefore, to point out the essential differences between a problem and an exercise.

There are parts of mathematics which require reinforcement and practice; the pupil must learn certain techniques, and practice in such is necessary. But once the technique has been demonstrated and practised the pupil is no longer in a problem-solving situation; rather he is learning a skill, practising a routine, and it might be claimed that such reproductive work constitutes too high a proportion of school time. It has been pointed out that the selection of sensible problems is the easiest way to increase the soundness of the pupil's thinking, but that problems must not degenerate into exercises (Buswell 1948). Furthermore, there is a danger in repetitive exercises; as is clearly demonstrated by the ease with which a tendency or 'set' may be induced, the effect of which may be to inhibit the pupil's thought processes and narrow his view of possible solutions (Luchins 1942). The rigidity of thought so induced may severely reduce the pupil's ability to face up to a new problem situation.

While an exercise requires a willingness to listen to, and learn from one who is something of an expert performer, and while such activity is clearly an essential ingredient of almost all traditional school work, it may be agreed that room must nevertheless be found

for the other activity, of problem solving, in which a solution cannot be found by simply choosing the appropriate method from a store of learned techniques. A problem may be said to exist when a difficulty is experienced, when that difficulty is accepted as a challenge to our mental powers, and when there appears to be no habitual response which will resolve the difficulty. Problem-solving in this sense does not usually form part of a school course, but it is suggested that there are good reasons why it should, not least among them being that mathematics may be seen to be a thinking, as well as a learning, subject.

3. REVIEW OF LITERATURE

Problem solving is not exclusively a human activity, and some of the experiments into problem-solving by animals have some interesting features. Two apparently different approaches are associated with the names of Thorndike and Köhler, the former approach being referred to in terms of 'trial-and-error', the latter in terms of 'insight'.

Thorndike's work (1911) appeared to emphasise the way in which a successful solution was often found by chance and thereafter was more likely to recur. In connection with maze problems incorrect 'solutions' are gradually eliminated until the correct path is traced without error. Köhler (1925), in his work with chimpanzees, set problems whose solution appeared to require a measure of intelligence or 'insight', the latter term implying that the animal is able to combine in some way the various elements of the task, or is able to appreciate the relation between the elements.

Experiments by Alpert (reported in Vinacke 1952) using pre-school children, led to a classification in terms of immediate, gradual or sudden insight. The most frequently occurring type of successful solution was that involving gradual solution with complete insight. Ruger investigated the ways in which puzzles of a mechanical nature were solved, and reported that often such a puzzle would be done by chance, the analysis of the problem then being reversed. The distinction was drawn between 'human' and 'animal' methods of solving, these terms being used rather in the sense of 'reasoning' and 'trial and error' respectively. This work is reported by Humphrey (1951) who points out that human beings often do not reason when faced with a problem situation.

The classic work in the field of problem solving is probably that

of Duncker (1945) who investigated the way in which students solved problems which required reasoning. In order to discover the ways in which the student approached and pursued a problem Duncker asked for the thoughts to be verbalised during the period of solution. The problems given were varied, including mathematical questions, and his conclusions are general. He points out that the solution to a problem has two aspects, for the solver has to give consideration to the goal and also to analyse the given situation. The solution is then likely to proceed in phases as the given situation is reviewed and its components re-ordered with a view to reaching the goal: in other words the solution may often arise by working from both ends, by means of an alternating interest and emphasis.

Two kinds of solution are referred to by Duncker, one being rational and the other due to 'resonance', by which he means the application to past experience being called into play by certain aspects of the problem. It is necessary for a solver to use the given aspects in different orders, re-organised in the light of what is to be achieved. The solution may come suddenly or more slowly by a series of gradually improving re-orderings of the given elements. The ease with which a person is able to solve a problem is a function of his flexibility, that is his willingness to re-think, or to 're-centre' (to use Duncker's word).

For Wertheimer (1961), problem solving depends upon an understanding of the essential features of the situation and their inter-relationships. To solve a problem sensibly, the solver must appreciate the 'inner relations' of the situation, and distinguish the essential from the inessential elements. Thus he speaks of 'productive' thinking in opposition to 'reproductive' thinking which he sees as the blind application of memorised rules. Furthermore, it is looking at each problem in its own terms, rather than looking at it in the light of similar problems, previously seen. As the solution proceeds it may become necessary to 'restructure' the elements and to change the emphasis. Hence the importance, in teaching, of avoiding the type of exercise which is no more than a blind application of learned techniques, and which 'induces habits of sheer mechanised action . . . instead of facing a problem freely'.

Polya (1945) looks at problem solving from the standpoint of the teacher, and regards the task of the teacher of mathematics as being the stimulation of the student's capacity for independent thought, not the imparting of routine skills. Mathematics, he

suggests, has two faces. Not only is it a rigorous science showing the strength of deductive reasoning: it is also an inductive science. Hence the importance of showing the pupil how the mathematical process arises and grows out of a problem, as well as presenting the final, polished, elegant structure. The problem-solving situation must therefore be analysed, and the student made aware of certain aspects of each problem situation. Thus there must be an understanding of the problem and what is required; the devising of a plan, which may require the restatement of the given problem; and the carrying out of the plan keeping a watchful eye always on the extent to which it is meeting the demands of the problem.

A similar approach by Hartung (in Buswell 1948) repeats the emphasis noted earlier on the distinction between exercises and 'genuine problems'. In the latter the situation is usually more complex, and the question itself may have to be formulated in mathematical terms. He comments that there are limitations to the usefulness of examples and stresses the importance of reflective thinking.

The more difficult problem often owes its difficulty to its 'open ended' nature. Bartlett (1958) discusses both the problems which need a filling in process between stated ends and those which require a leap of thought beyond the given evidence. His comment that 'the capacity to use minimum information to produce a result is a good indication of high intelligence' is in agreement with Duncker's belief that a person's consideration of the components of a problem should be sufficient to provide the mode of attack.

A different comparison is drawn by Holt (1964), who points out that while a 'producer' is only interested in getting right answers to given problems, the 'thinker' tries to judge the meaning and reality of the problems. The problem solving strategy of the former tends to be of the hit-or-miss type, while the latter is more willing to carry on trying because 'he can tolerate uncertainty'. The difficulty of guiding a pupil by means of questions is emphasised, for this can result in the pupil's dependence upon a teacher's question, unless the pupil is an active participant in the process of solving and is thus formulating the appropriate questions on his own behalf.

Strategies employed in concept formation have been studied by Bruner *et al.* (1958), and also have applications to problem-solving. The distinction may be made between the solver who carefully considers the separate elements of the problem and their inter-relationships, and the solver who tries to combine all the elements

together correctly in one step. Clearly such strategies may both occur in a given situation, just as methods of 'trial and error' may mingle with 'reasoning'. As Peel (1960) puts it, 'Playing a hunch is very prevalent even among intelligent and mature people'.

Brief mention may be made of the relationship between strategy and personality which was the subject of an enquiry by Bloom and Broder (in Vinacke 1952). The investigation of individual cases with a view to increasing the individual's ability to deal with a problem could be of great value. Factors of age and intelligence also are of interest; while it may seem reasonable to suppose that the older person, or the more intelligent person, would have certain positive advantages over the younger, or the less intelligent, it is quite possible to suggest that problem solving ability remains more or less fixed in 'amount' though capable of wider application as the person grows older. Both Burt (Hadow Report 1927) and Isaacs (1948) have supported the view that, by the age of seven years, the essential components of valid reasoning were present and that later growth simply enabled the child to exercise these components on a wider variety of more complex situations.

Support for the latter view comes also from the work of Heidebreder (in Vinacke 1952) who suggested that the ability to solve problems increased with age, and gave two factors which may cause this: namely increased responsiveness to the problem, and the emergence of more adoptive modes of response. The claim was made that 'the total reaction involved in solving problems is recognisably present in four year old children'.

In making reference to this last work and others, Vinacke (1952) says 'The experiments on children (to which he refers) show that there is a positive correlation between successful solutions and increasing C.A. and M.A., but these correlations are surprisingly low'. He goes on to ask whether this low correlation is due to methods of instruction, differences in personality, or perhaps the fact that intelligence tests may not measure problem-solving ability.

One of the aims of the present enquiry was to investigate the relationship between problem-solving ability and increasing chronological age, and to this we now turn.

4. METHOD OF INVESTIGATION

In this section will be considered (a) the sample of subjects (b) the

choice of problems (c) the method of investigation (d) the method of assessment.

(a) The school in which the enquiry took place was a boys' three form entry grammar school in a town of about 120,000 inhabitants. Entry to the school was quite highly selective based upon the results of an 11+ examination in Verbal Reasoning, Arithmetic and English supplemented by Primary Head Teachers comments. The operation of a quota system ensured that there was a very wide spread of social and economic classes, drawn from a typical semi-industrial Midland town. Usually there was formed an 'express' stream composed of boys thought capable of proceeding to 'O' level in four, rather than the usual five years, and these ' α ' boys being chosen on the basis of very high I.Q. and particularly good academic performance in Primary school work. One possible comparison of problem solving ability, in addition to the main consideration of age, was of α boys compared with non- α boys. Furthermore the organisation of the Mathematics Department into a system of sets, from the third year onwards, made it possible to consider how upper sets, formed on the basis of performance in orthodox mathematics examinations, would compare with lower sets. A total of 492 pupils took part in the enquiry, which implies that practically every boy from form I to form V was included, but no attempt was made to include VI form boys because it was felt that the effects of later specialisation in Mathematics might cloud comparisons which otherwise were being made on the basis of a fairly common experience. As there were ten problems it can be seen that approximately 40-50 boys attempted each one, and each group was chosen at random from all ages and abilities within the sample.

(b) The ten problems varied a great deal both in difficulty and in the extent to which they reflected normal school work. Some were chosen because they could be solved by techniques which form part of every mathematics 'O' level course, others were of a type which would not be amenable to such techniques. In any event all the problems could be solved by methods involving no more than the application of common sense, logical reasoning and perseverance, by anyone with a background of primary school arithmetic. The problems thus fell into two broad groups; those which were related to school work closely enough to suggest methods of attack initially even if difficulties were experienced as the solution proceeded, and those which were quite unfamiliar and presented the subject

with a problem immediately. A few examples may illustrate the point.

Problem 1 A farmer has cows and chickens on his farm. There are 50 heads and 172 legs altogether. How many cows are there?

Problem 2 Calculate the difference between the first 10 even numbers and the first 10 odd numbers. If you had to deal with 50 of each, instead of 10 of each, how would you do it?

In both these problems school arithmetic or algebra suggests a method. The addition of the sets of numbers in the second problem presents little difficulty if only 10 of each are referred to, but would prove very tedious if extended to 50 of each. The solution is obtainable in that way, but can be arrived at much more easily with a little thought concerning the two sets of numbers involved. The use of school algebra in the first problem leads to a speedy solution, but is not at all necessary because there is a simple and direct solution involving only the allocation of two legs each initially.

Problem 6 Any six digit number like 372,372 or 495,495 (in which the same three digits occur twice in the same order) is divisible by 13. Why should this be so?

This problem would rarely occur in a school course, though divisibility by other numbers is usually dealt with. Here the solver must recognise the essential feature of such a number (as Wertheimer said), that is the pattern of repetition. Obvious though this may be, or seem to be, very few solvers did in fact investigate the pattern itself and its implications.

Other problems were less obviously numerical, and called for an explanation of some result (as in problem 6). In many cases the interest of the problem lay less in any answer which may have been arrived at than in the principle which underlay the problem. The appreciation of the essential nature of the problem, and the way in which the solution responds to the essential difficulty—these are the points of interest.

(c) In studying the activity of problem solving, there are two extremes, which may be referred to as 'objective' and 'subjective' methods according as the experimenter remains detached from the situation or actively participates. If the problem is presented, and the solution proceeds while the experimenter remains a bystander, then much useful information may be missed, for a great deal of thought may be going on and many mental attempts be made by the

subject without any external and visible sign. On the other hand, if the subject feels that the experimenter is willing to act as a teacher, ready with advice and appropriate questions at the first sign of inactivity, then there is a danger that the subject will rely too heavily upon such comments. The first method is objective but may show little of the subject's mental activity; the second may produce more positive results but these may be a reflection of the experimenter's thought rather than that of the subject.

The method used in this enquiry represents a middle path. The subject is firmly placed in the position of problem solver (rather than pupil or learner) while the experimenter is willing to answer questions (but in as non-committal way as possible), and willing also to prompt the subject (but only when really necessary). Every effort was made to put the subject at his ease; the emphasis being very clearly placed on the way the boy chose to deal with the problem rather than on getting the answer. The 'test' atmosphere was avoided as far as possible and the subject was encouraged to put his thoughts into words to enable the experimenter to follow the attempts made. Such attempts were to be written down by the subject if he wished to do so while the experimenter confined himself to brief prompts such as 'What are you thinking?' or 'Have you any other ideas?', or to questions designed to clarify the processes being adopted by the subject. The task of the experimenter was to record, to encourage, to clarify, and not to help, as a teacher might naturally wish to do, by asking particularly pointed or leading questions.

This method of 'talking out' a solution is not without difficulties. In particular there is the difficulty of expressing rapidly occurring thought, and the subject's natural unwillingness to give voice to ideas which may be regarded as stupid. The fact of being in a position of mental effort may be sufficiently daunting without the added complication of expressing thoughts in words; and such thoughts—occurring rapidly as various modes of attack are brought to mind and discussed—are not easily verbalised. Schoolboys (and girls of course) are not normally called upon to uncover their thought processes: indeed in mathematics especially are they encouraged to hand in the final, polished version of a solution, and to regard the necessary pre-thinking as so much 'rough work' to be crossed out. But despite these difficulties (and others connected with the limited time within which the solution was attempted) which may be said to militate against efficient and successful problem-solving behaviour,

there seems to be no alternative if one is interested in the mental activity rather than the final solution. It has been said (Broadbent quoted in Dienes & Jeeves 1965) that 'We learn little from verbalisation that we do not learn from performance', but if a solution is not reached there is little to learn from performance, while there may be much to learn from verbalisation. The merit of the approach used here is that the experimenter may ask 'why?', and it is often only by doing so that difficulties can be pin-pointed, blockages revealed, and the thought processes laid bare. Despite its difficulties it is a method which has been used to good effect by several workers in this field, notably Duncker (working with college students) and Piaget (whose subjects included both infants and adolescents).

(d) When is a problem solved? At what point can it be said that a person has successfully solved a problem? In a great deal of normal school work in mathematics an answer is to be obtained, and the obtaining of the correct answer would count as a successful completion of the question, provided of course that there were no obvious mistakes in the manner of obtaining it. The emphasis in this enquiry was placed less upon the answer, more upon the method, and it was felt (in accordance with the work of Duncker and of Wertheimer) that the solution should be a response to the essential nature of the problem. For example in Problem 2 the correct answer is obtainable by finding the sum of the even numbers (which is 110), the sum of the odd numbers (which is 100) and subtracting one total from the other to give an answer of 10. To repeat such a process when 50 of each type of number were required would be a slavish pursuit of a very tedious method. The point of the problem (Wertheimer's 'essential feature', and Polya's 'understanding of the problem') lies in the fact that adjacent numbers differ by 1, so that the difference asked for is clearly the number of such numbers; that is to say the answer is 10 when there are 10 of each, 50 when there are 50 of each and generally n when there are n of each. Such an appreciation clearly avoids the necessity of finding totals, and in fact solves the problem by responding to its essential feature. This appreciation, and not simply the correct answer, counts as 'success' in this enquiry, and similar considerations apply to all the problems which were set. It often happened, of course, that such appreciation did not occur until a more tedious method had been employed and an answer obtained thereby. At such a time the subject would quite freely volunteer the comment that such a method was clumsy, and in due

course would arrive at the appreciation of the true (and easy) response. On some occasions it was necessary to ask the subject whether any method other than the tedious one could be applied; but whether the appreciation came unprompted or not, it is such appreciation which counts as success, and this should be borne in mind in considering the results.

5. RESULTS AND DISCUSSION

The initial aim of the enquiry was (a) to investigate problem solving ability and its relationship with age (over the range 11-16 years). Further comparisons which could be made concerned the relative performance of (b) upper and lower mathematical sets (determined by previous performance in orthodox mathematics examinations), and (c) of quick stream and normal pupils (determined by I.Q. and overall academic ability). To these three aims we now turn.

(a) Two statistical tests were applied to the results in this section. The comparison of two variables, one of which is continuous and the other dichotomous may be used by using the Biserial Coefficient of Correlation (Guilford 1950). This coefficient was calculated for each problem and varied from $+0.49$ to -0.21 . The only problem for which the coefficient reached the 1% level of significance was the first, which in fact was the one which most closely resembled normal school work in mathematics and might therefore have been expected to show such agreement. Of the other coefficients, all but two were positive; this is perhaps what might be expected. The overall value of the coefficient was 0.104 which, while positive, is small and certainly not statistically significant.

An alternative technique is offered by the Chi square test, a non-parametric test which makes no assumptions about either the normality of the variables' distributions or the similarity of their variances. The particular form of the Chi square test used was the Median Test (Garrett 1926), which requires that the continuous variable be divided into two classes, at its median point, thus providing classes described hereafter as Above and Below. As the continuous variable here is Age, these two classes represent the older and younger pupils respectively. Table 1 shows the distribution of the total sample of 492 subjects.

TABLE 1

Distribution of total sample by age

	Pass	Fail		
Above median	118	128	246	$X^2 = 2.1$
Below median	102	144	246	$0.10 < p < 0.20$
	220	272	492	

It will be seen that although the tendency of the relationship towards the expected result, the extent of such is certainly not statistically significant.

(b) In this and the next section the Chi square test only is used. Table 2 shows the distribution which occurs when comparison of upper and lower mathematical sets is made. The allocation to such sets was based primarily upon the results in orthodox mathematical examinations at the end of the previous year. The total number of subjects here is 212 if we consider first those who were not quick stream boys. In other words the comparison attempted here is between normal boys attempting 'O' level in five years, but in an upper mathematical set, and similar boys in a lower set.

TABLE 2

Distribution of normal subjects by mathematical sets

	Pass	Fail		
Upper set	47	33	80	$X^2 = 2.77$
Lower set	62	70	132	$0.05 < p < 0.10$
	109	103	212	

The boys referred to in Table 2 were from the third, fourth, and fifth years only, for the arrangement of mathematical setting applied from the third year upward. It is seen that while the tendency is again in the expected direction (that is upper set being more successful than the lower set), the 5% level of significance is not attained. If however we compare upper and lower sets including the quick stream boys (of third and fourth years) we have a sample size of 279, as shown in Table 3.

TABLE 3

Distribution of normal and quickstream subjects by sets

	Pass	Fail		
Upper set	74	44	118	$X^2 = 7.12$
Lower set	75	86	161	
	149	130	279	$p < 0.01$

The presence of the quick stream subjects results in a significant value (at the 1% level) and this leads us to a direct comparison of quick-stream with normal subjects.

(c) For this comparison the whole sample of 492 subjects is divided into quick-stream and normal groups, and the results are given in Table 4.

TABLE 4

Distribution of whole sample by streams

	Pass	Fail	
Quick stream	79	51	130
Normal	165	197	362
	244	248	492

$\chi^2 = 8.83$
 $p < 0.01$

An alternative possibility would be to make the same comparison but using only the subjects in Years 1 to 4; the reason being that the quick stream boys of year 5 were in fact already in the Sixth Form and thus excluded from the enquiry. Thus the fourth year is the last in which such comparison should be made. Table 5 shows the results.

TABLE 5

Distribution of subjects of Years 1-4 by streams

	Pass	Fail	
Quick stream	79	51	130
Normal	127	161	288
	206	212	418

$\chi^2 = 9.96$
 $p < 0.01$

The Chi square values resulting from Tables 3, 4 and 5 all reach at least the 1% level of significance, whereas those based on Tables 1 and 2 do not even reach the 5% level. The implication would appear to be that the presence of the quick stream boys is an important factor.

The interpretation of these results must be a cautious one, for several reasons. Clearly this enquiry was a narrow one both in the choice of problems and in the choice of subjects. There were ten problems of varied difficulty and type, and to that extent it would be argued that the problem-solving techniques demanded were varied too. On the other hand the fact that the problems were chosen by the author may indicate his preference for a particular mode of thought. The subjects too, though believed to be typical in many ways, were clearly from a highly selective school. There may very

well be variations in performance if the same set of problems were set to a non-selective sample, or to girls as well as boys.

A further comment may be made concerning the different sizes of the samples from which the Chi square values are calculated. Tables 1 and 4 include all 492 subjects, whereas Tables 2, 3 and 5 include 212, 279 and 418 subjects respectively. Might it be that Table 2, for example, would show a significant value if the sample size had been larger? The answer is No. With a sample size of 492 and with such a sample showing the same proportions as in Table 2, the Chi square value would have been 6.37 which indicates a significance level between 1% and 2%. On the other hand if the numbers of Tables 3 and 5 are similarly regarded, the Chi square values become 12.8 and 11.9 respectively, both values being significant beyond the 0.1% level. Briefly we may say that, with these adjustments, Table 5 shows the very significant superiority of quick-stream pupils; Table 2 shows some superiority (reaching 2% level of significance) by upper set pupils. Table 1 shows such a slight superiority of older pupils as might be due to chance.

6. CONCLUSION

The results given above suggest that ability in problem solving may be related far more closely to intelligence and general academic strength, than to mathematical ability as demonstrated in orthodox school examinations in the subject. It seems likely that the mathematics syllabus has for too long been dominated by the need to learn and reproduce particular techniques. Traditional syllabus work and traditional methods of teaching together may over-emphasise such needs, especially in the face of traditional examinations. The newer syllabus, the so-called Modern Mathematics, and the increase in 'discovery' methods especially in the Primary school, may help to redress the balance, and may encourage a problem-solving approach. As it is, the ability to solve problems appears to be called upon to a very limited extent in the teaching of mathematics, with the result that very often a pupil's interest in the subject may wane. The high level of interest shown by the subjects in this enquiry may encourage those who are keen to change the emphasis in mathematics teaching from 'learning' to 'thinking'.

Note. This paper is based on a thesis submitted in the University of Birmingham for the degree M.Ed. 1968.

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CHAPTER V

SOME ASPECTS OF ADOLESCENT THINKING IN SCIENCE

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1. INTRODUCTION

RESEARCH concerned with adolescent thinking in science has been summarised recently in the Schools Council Research Bulletin No. 3 (1970). This paper describes an investigation by the present writer (Wells, 1970) and mentioned briefly in that report (p. 153).

Seven demonstration experiments, three of which are described below, were presented to groups of secondary modern school boys, and written answers were obtained to short questions based on each experiment. The responses were graded on a scale from intuitive through describer to explainer thinking (and a transitional 'extended describer' level was recognised).

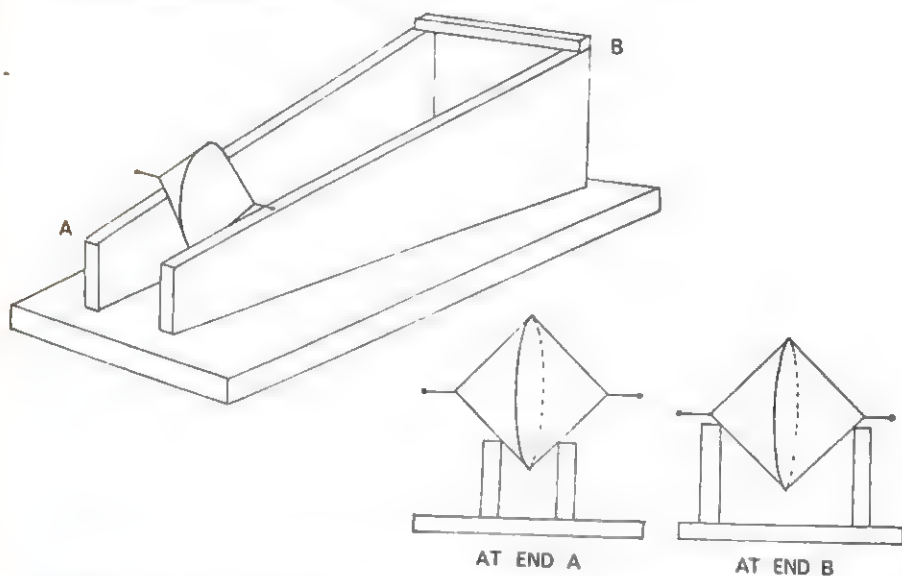
The first two terms, introduced by Peel (1965, p. 171) correspond broadly to concrete operational and formal operational thought respectively. '*Description* . . . entails no more than the relating of the parts of a phenomenon with each other. *Explanation* involves referring the phenomenon to other experienced phenomena and to generalisation and concepts independently formed.' Again (Peel, 1968—see also 1971) 'if in our response to any set of phenomena or any problem pattern or sequences, we attempt to group and relate the parts, then this is *description*. Describer thinking answers the questions—how is this made up? What are its features? 'If the thinker relates the phenomena, patterns and sequences to outside concepts, wider causes and generalisations, then we have *explanation*, e.g. relating the pendulum to gravity. Explainer thinking answers the questions—why is this so? What is its conceptual basis? What is it an instance of? In what context does it fit? The comparison may lead to acceptance, modification, or rejection of the explanation offered.'

The progression of the quality of thinking was found to correlate more highly with the mental age of the subjects than with their

chronological age. Other aspects of their thinking were investigated, notably their ability to draw inferences and their elementary use of analogies. The three experiments discussed were: 1. The rolling of a bevelled roller along a widening and sloping groove; 2. The solubility of ammonia experiment; and 3. The release of open inflated balloons to illustrate space travel.

2. THE THREE DEMONSTRATION EXPERIMENTS

1. *The Roller Experiment*



A length of iron rod was placed at end A against a retaining bar (not shown in the diagram). It did not move. The same rod, placed at B, rolled down the track to A.

The double cone 'roller' was then placed on the track at end A and was seen to roll to end B.

The following questions were asked:

1. As it rolls along, what happens to the middle of the roller (seen from the side)?

2. Is it true to say that the roller goes uphill? Why?

The responses were placed in categories which were initially:
Category 0—intuitive, irrelevant, answers

Category 1—elementary describer; depending entirely upon direct observation

Category 2—extended describer thinking in which the subject, though still largely dependent upon the facts as seen, draws upon other knowledge to arrive at some further answer.

Category 3—Explainer thinking—where the subject draws upon his knowledge of some general principle to deduce an answer to the question or is able to give an explanation in some detail, referring perhaps to a hypothesis.

Categories of response and mean ages in years and months

Question	Category	n	Mean C.A.*	Mean M.A.†
1	0	15	13.9	13.11
	1	71	14.5	15.3
	2	26	14.5	15.5
2	0	25	14.0	13.9
	1	25	13.9	14.1
	2	56	14.5	16.7
	3	6	15.5	17.1

* C.A.—chronological age

† M.A.—mental age

If the two describer categories are pooled the table may be rewritten in the following form:

	Question 1			Question 2		
	n	C.A.	M.A.	n	C.A.	M.A.
Intuitive Level	15	13.9	13.11	25	14.0	13.9
Describer Level	97	14.5	15.4	81	14.4	15.5
Explainer Level				6	15.5	17.1
	112			122		

The extent to which these questions were able to command a wide range of quality of responses differed considerably. Question 2 brought out the changing quality of thought most effectively.

A few subjects held the view that the roller was going uphill and that its movement was caused by some concealed weight or arrangement of magnets.

The majority of the subjects were more careful in their observations and reported that the ends of the roller went very slightly 'downhill' and that this was caused by the widening of the track allowing the roller to run progressively outwards to the narrowest parts of the tapered halves.

It was interesting to see that some half-dozen older boys who were following an engineering course had no hesitation in measuring the height of the roller from the base board at the beginning and at the end of its run and treated the problem as one of simple engineering.

Very few boys showed explainer thinking which involved deduction from a general principle. However, one older boy wrote: 'the middle of the roller is inevitably going downhill so as to make the roller run from A to B, because the sides broaden (the track widens) to a greater extent than the one side of the roller so the centre of gravity of the roller is going downhill. The general appearance of this experiment leads people to believe that energy can be taken from nowhere to make the roller go uphill, for if the sides were parallel it would not go uphill. So the explanation must be in the broadening of the sides.'

2. *Ammonia Solubility—the fountain experiment*

1. The apparatus was first described and then the entry tubes were immersed in a tank of water. The clips closing off the flask were then opened. No water rose up the tubes.
2. The standard fountain experiment was then demonstrated, the flask now being filled with ammonia gas. The water in the tank was coloured with red litmus. As it fountained into the flask it changed to blue.

One of the four questions asked was:

Why did the water rise up in a fountain, that is, why did it run up into the flask?

In the analysis of responses to this question, five categories were used in all:

Category 0—intuitive

Category 1—*simple describer answers* which were concerned with what was seen, e.g. (a) ammonia was involved in some direct way 'it made a vacuum'. or 'it was weaker than air;' (b) the water blown in had some direct effect.

Such answers offered a direct and simple link between the fountain and an observed detail. There were several examples of Lunzer's first level of explanation.

Category 2—*extended describer level answers*—reached out beyond the facts as directly seen and referred to pressure difference inside and outside the flask. But they offered no reason or an inadequate reason for the pressure difference.

Examples were:

'the water ran into the flask because the pressure was not the same when you put the gas into the flask—it pulled the water up and also made the pressure the same'.

'the water rose in the fountain because there was a lot of pressure pushing and very little pushing down. It ran up the flask because there was no air pushing down that would hold the weak acid from coming up'

Category 3—included elementary explainer answers and in Category 4 were more complete explanations:

'The bit of water that was blown in through A dissolved some of the ammonia and caused a vacuum at the top of the flask. The water rushed in to fill the space and more ammonia was dissolved'.

'The water rose because there was no air pressure in the flask. It had been driven out by the gas which in turn was absorbed by the small quantity of water blown in'.

From one script several responses combined to give this statement:

'The pressure inside the flask was reduced and the water rushed in to take the place of the gas, i.e., the pressure on the outside was greater than that of the inside. After the water had been blown into the tube the gas must have dissolved because the water flowed up the tube. This means that water makes ammonia gas dissolve.'

Relation between category of answer and age

Category	n	Mean C.A.	Mean M.A.
0	15	12.9	12.8
1	40	13.2	13.1
2	79	13.10	14.8
3	28	13.11	15.6
4	11	14.6	16.11

On a coarser grading the table is:

Level of Thinking	n	Mean C.A.	Mean M.A.
Intuitive	15	12.9	12.8
Describer	119	13.7	14.2
Explainer	39	14.1	15.11

Hypotheses and guesses

There were some very interesting examples of hypotheses including the following:

'ammonia is a weaker gas than air, so it has not got the force to stop the water from rising'

'the water rises in the fountain when you blow up the tube because you blow air in and the air inside evaporates'

- 'the gas took all the air and therefore water was sucked up'
 'the ammonia had burned the air so that there was no air in the tube'
 (N.B.—an answer by a form 2B boy—shortly after a demonstration
 of water rising in a bell jar because of burning phosphorus in the
 enclosed air)
 'ammonia had killed the air'
 'ammonia had weakened the air pressure'.

These and other similar responses went some way towards explanation by isolating the crucial area in the problem situation, i.e., a reduction of pressure inside the flask. A next step seemed to draw upon available knowledge and experience to help explain the pressure reduction in ways such as exemplified above. The task of testing or evaluating the consequent hypothesis (or hypotheses) was a difficult step and in fact the method used in this investigation provides little evidence on the point.

3. Inflated balloon experiment and space flight

Questions were given to 136 boys whose ages ranged from 11 to 14 years. By Physics G.C.E. 'O' level standards, the questions were elementary, but few boys in the sample were following such a course.

The questions considered included the following:

1. A toy balloon was blown up and then released
 - (a) what was happening inside the balloon as it was blown up?
 - (b) Why did the balloon shoot across the room when it was let go?
- The same categories of thinking were identified as utilised in the previous experiments.

Analysis of responses—category of response against mean chronological age and mean mental age

		age and mean mental age						Category 2	
		Category 0		Category 1					
	n	C.A.	M.A.	n	C.A.	M.A.	n	C.A.	M.A.
1a	6	12.5	13.10	69	13.2	13.10	50	13.5	14.6
1b	1	13.5	14.10	89	13.4	14.0	45	13.3	14.8
		Category 3			No response		Total		
	n	C.A.	M.A.						
1a	11	14.4	16.5	0			136		
1b	1	13.11	16.10	0			136		

About half the total possible responses were at describer level. Extended describer level (about $\frac{1}{4}$ of the total possible responses) appeared at about 13½ years C.A. and 14½ years M.A.

The possible responses for each experiment were as follows:

Expt.		No. of questions	n	Total possible responses
1	Roller	4	112	448
2	Coal gas explosion	6	149	894
3	Ammonia solubility	4	173	692
4	Connected cans	5	115	575
5	Bi-metal bar	3	83	249
6	Gauze	4	84	336
7	Space: jet effect	13	136	1,768
		39	852	4,962

4. For each level of thinking there was quite a wide spread about the mean, both for chronological and for mental age. Factors other than age and intelligence were, of course, bearing upon the quality of thinking (see, for example, Fox 1969). Little quantitative evidence about these other factors was provided by the investigation but there is little doubt that the methods of teaching science which the boys had been used to and the style of questioning used in the investigation had important effects.

5. The analysis of responses over the whole range of the investigation suggested the following pattern of developmental changes between describer and explainer levels of thinking.

Describer Level

Closely tied to the facts as perceived.

Extended Describer Level

Developing ability to deal with data; increasing knowledge 'store'; using leads provided by the pupil's knowledge as seen by him to be relevant—may provide a partial explanation.

Explainer Thinking Level

Comparing several hypotheses; evaluating a limited store of hypotheses; recognising the relevance of a general principle and looking back on the problem from this viewpoint; using the abstract to order the facts.

The term '*extended describer level*' represents a stage of cognition development when the balance between dependence upon the facts observed and independent thinking which can embrace those facts is being displaced in the direction of independence.

It is in some ways parallel to the social development of the adolescent as he moves from dependence upon adults towards maturity

and independence. In the cognitive field, the adolescent becomes less and less tied to the facts as perceived and moves towards a freedom through the recognition and use of generalisations into which the facts fit—a reversal of the relationship between the real and the possible.

This extended describer phase corresponds broadly to category 2 of the analysis used in the investigation.

The distribution of all category 2 responses by mean chronological and mean mental age is summarised below and points to extended describer thinking being chiefly associated with a mean chronological age of 13 to 14½ years and a mean mental age of 14 to 15½ years.

Years and months	Occurrences of extended describer responses and age	
	by mean chronological age	by mean mental age
13.0-13.5	658	
13.6-13.11	440	
14.0-14.5	161	91
14.6-14.11	114	326
15.0-15.5	—	587
15.6-15.11		209
16.0-16.5	13	72
16.6-16.11		20
17.0-17.5		56
17.6-17.11		13
		12
	1,386	1,386

6. There were many examples of this transitional quality of thinking in which only partially successful hypotheses were advanced. The distinction between a hypothesis and a guess is an interesting one.

Rogers (1960, p. 343) defined hypotheses as 'single tentative guesses—good hunches—assumed for use in devising theory or planning experiment, intended to be given a direct experimental test when possible'. Another definition by Davis (1968, p. 23) is 'a suggested explanation of certain observed phenomena tentatively adopted until it can be tested experimentally. . . A hypothesis does not have to be correct in order to be useful'.

Many of the suggestions advanced in category 2 responses deserved the title of 'hypothesis'. The important next step of testing the hypothesis (in thought or by experiment) and comparing hypotheses to

arrive at the most suitable one, cannot, as yet, be made. It would seem to await:

- (a) wider repertoire of possibilities,
- (b) a deeper understanding of the leads taken up,
- (c) a more mature ability to discriminate.

There would seem to be the dual need for more experience and greater ability to put the knowledge gained thereby to good use.

Use of analogy. Another characteristic of thinking below the explainer level which was quite marked was the tentative exploratory use of analogy. Bronowski (1964, p. 31) suggests that 'the scientist or artist takes two facts or experiences which are separate; he finds in them a likeness which had not been seen before; and he creates a unity by showing that likeness'. This is the mature creative mind at work.

Many boys showed thinking which was just beginning to skirmish with these possibilities. In one section of the investigation a question early in the set of thirteen asked for the explanation of the flight of a toy balloon—blown up and then released.

Later a similar question was asked about a rocket used to launch a space ship. There were several respondents who said the rocket 'went just like the balloon'. Examination of the earlier answers showed that the movement of the balloon had not been explained in any satisfactory way. It was as if, in the process of explaining balloon and rocket, one small advance had been made by simply recognising some element common to both.

Other cases of tentative analogies were seen in the scripts which suggested that the purpose of the screws placed round the 'equator' of the roller were acting 'like a windmill' or 'like the arms of a skater'.

There was also evidence of limited ability to profit through analogy. Thus the heating of a clearly distinguishable pair of different bars rivetted together produced a curving to accommodate differential expansion. The behaviour of a compound bar (with less easily seen two layers) was similar but the ability to argue that similar behaviour might mean similar construction was absent in a surprisingly large number of cases.

Inferences. Similarly there was frequently an inability to make inferences about the solubility of ammonia from the evidence of the fountain experiment. It was not until a mean chronological age of 14.6 and a mean mental age of 16.3 that a satisfactory conclusion

could be drawn.

About half the boys who saw the connected cans experiment were unable to make any useful inference about the arrangement of tubes and liquids so that they could make a diagram of these arrangements. In view of the frequent use of diagrams in science teaching it is of interest that the ability to construct even a partially accurate working diagram did not appear before a mean chronological age of 14.9 and a mean mental age of 16.3.

Levels of explanation

Peel (1965) commented 'it is doubtful how far pure description is possible without any hint of explanation.'

Lunzer (1968, p. 298) made a similar point: 'in its broadest sense explanation is not something which occurs only about the period of adolescence. Even very young children are capable of giving perfectly valid explanations of phenomena.'

Corresponding to Piaget's level of concrete thinking, Lunzer finds a level of explanation which involves 'the subsumption of phenomena under the category of a general class of events subject to a necessary law'.

At a later stage, corresponding to the level of formal thinking in mid and late adolescence, explanations lie in 'the interpretation of phenomena in terms of the interplay of necessary laws which depend for their enunciation on the complete analysis of the events and the abstraction of their determinants'.

These two levels of explanation are exemplified frequently throughout this investigation. Thus the younger child 'prepared to recognise a necessity in the regularities appearing in the course of his experience' as illustrated in the roller experiment recognised that the roller had to go downhill because of the tapered tracks.

'The individual at the formal level is prepared (sometimes) to demand such a necessity', thus 'the roller inevitably goes downhill and the taper allows this'—or—'it can only go uphill if energy is supplied, so the tracks must allow it to go downhill'.

4. SOME APPLICATIONS TO SCIENCE TEACHING

1. The importance of the inclusion of science in the school curriculum is beyond serious dispute. Many reasons are advanced in terms of fitting our pupils for their role in modern society. There is also a justification in terms of the pupils' cognitive development.

The hypothetico-deductive method, so powerful an instrument in science, is one important characteristic of the highest levels of human thinking. If it is possible to achieve some positive transfer from thinking in science to thinking in other subject areas and in the wider aspect of everyday living, this in itself would be of immense value.

2. The incidence of explainer thinking was rare amongst the secondary modern children who took part in this investigation. However, there were many examples of 'low grade' or partial hypotheses which seemed to demonstrate that:

- (a) the pupils concerned had identified the problem area,
- (b) from their limited resources of possible explanations they had made quite useful guesses.

Their incomplete success was probably related to:

- (a) a lack of sufficient or sufficiently rich store of concepts—thus limiting the choice of hypotheses and permitting an only partial evaluation of the chosen hypothesis,
- (b) lack of ability in testing the chosen hypothesis,
- (c) in any case pupils had no chance of putting their hypothesis to a practical test even if they had been able to devise such a test.

There is the obvious need to enlarge the pupils' store of possible explanations, i.e. to build up new concepts and to enrich and extend existing ones. There is also a need to provide experience of processing evidence and observation using both induction and deduction and to give experience of constructing and testing hypotheses.

Submitting hypotheses to practical procedures may well produce impossible demands and discussion with a teacher who is prepared to guide and prompt, to stimulate questions but be slow to give answers may be the best way in a busy laboratory session.

In general the findings of this investigation give support for the proposed strategies for learning outline by Hilda Taba (1969). She identifies four main targets of learning: (1) knowledge (which depends upon the content of the curriculum), (2) thinking, (3) attitudes, (4) skills (all of which depend upon the sorts of learning experiences provided). In the promoting of thinking she suggests that there are three cognitive tasks:

- (1) concept formation,
- (2) interpretation of data,
- (3) application of facts and principles to new situations.

Upon these and some other considerations teaching strategies have been developed.

Practical work

There is evidence from this enquiry that secondary modern pupils find difficulty in making inferences and drawing conclusions even when cues are provided. The chances of them deriving a great deal of understanding from their own unaided experiments in an entirely open-ended situation would seem to be very slight, at least until they had become more used to that form of working.

For the majority, there would seem to be a need for carefully structured practical work in which the 'answers' or inferences are easy to see and a line of argument or reasoning is broken down into simple steps. The term 'stage-managed heurism' would seem to be most appropriate.

Carefully devised work cards and oral reporting of findings by pupils and their discussion by the class under the guidance of the teacher have great value in maximising the benefits of practical sessions. An important but time-consuming step in the education process might be gained by giving serious consideration to the pupils' partially correct responses and to improve the concepts or the cognitive procedures by which they came.

A *circular or spiral syllabus* would also seem to favour the teaching-learning strategy by which concept resources and cognitive skills are promoted together.

The need for *appropriate homework* and test questions and *suitable assessment procedures* needs no emphasis.

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CHAPTER VI

MATURITY OF RELIGIOUS JUDGMENTS AND DIFFERENCES OF RELIGIOUS ATTITUDE BETWEEN THE AGES OF 13 AND 16 YEARS

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I. THE PROBLEM AND ITS RELATION TO PREVIOUS RESEARCH

WHILE considerable material exists concerning the content of Religious Knowledge and in particular, religious attitudes of adolescents there is relatively little on how children evaluate and think about religious material. This is particularly true of adolescents.

In *The Individual and His Religion*, Allport describes three stages in the development of religious belief. The first stage is a period of raw credulity where one believes in the evidence of one's senses and imagination. The next stage is characterised by doubts of many sorts which flood in. Finally, a mature stage grows out of alternating doubts and affirmations that characterise productive thinking. This final stage is unique by integral and gives a leading directive to life as a whole, summed up by the phrase: 'my whole desire sightheth after thee'. While this is speculative, it shows the insight of this man and the levels he suggests are to some extent supported by the rather scanty research.

Harms (1948) suggested that there are three stages of development where religion is concerned, culminating at adolescence in an 'individualistic' stage, which is marked by a mature application of religious imagery.

Goldman (1964) in a much read and widely discussed work suggests that there are Piagetian levels of religious thinking through which children pass. These he designates firstly, pre-religious marked by wild unconnected guesses. This he says is comparable with the Piagetian intuitive stage. The second stage he calls sub-religious

and this is comparable with Piaget's concrete operational stage and was marked by answers evoking cause and effect. Finally, the last stage, is marked by abstract thinking, the kind of thinking involved in Piaget's formal operational level. Goldman calls this the religious stage.

In 1966 Goldman investigated this final stage in relation to the biblical story material he had previously used and concluded that since religious thinking is essentially an interpretation of experience, children must have had primary mental stimulation, undergone some form of perceptual activity and developed some capacity for abstract thought before the profound truths of religion can be appreciated. This is not the same as acknowledging the truth of them in terms of commitment.

Further research into adolescent religious thinking is sadly lacking. This may be due to the lack of an adequate measure.

Peel and his researchers appear to have the best existing measure of the quality of thinking at the formal operational level. The method employs passages of connected prose and involves an element of subjectivity in the marking. The initial study used passages involving social situations. Three main levels of judgment were observed. These could be discerned by chronological age. Subsequent research suggests that mental age affects the chronological age at which the various levels appear. Other passages have since been applied to assess adolescent thinking about a number of school subjects. Three of these studies with some relevance on this work are de Silva (1969) on History, Rhys (1964) on Geography and Loughran (1957) on Moral Judgments. de Silva's work is of interest in connection with this study because of the type of passage used. Rhys used a classification of his answers similar to that used in this study. Loughran's work is related since he used passages to evoke moral judgments and found that there was no evidence to suggest that the levels of moral judgement postulated by Piaget emerge at distinct chronological ages.

Where religious attitudes are concerned much research has taken place. Much attitude testing has been and is subject to considerable criticism. Nowhere is this more true than in relation to religion. This being understood, studies of adolescent religious attitudes have shown that many adolescents consider religion irrelevant to the needs of modern man. Hyde (1959) made a comprehensive study of religious attitudes which suggests a tendency for favourable attitudes

to deteriorate in the first three years of secondary school and after the third or fourth year to improve. The second and third years show the greatest deterioration. He also suggests that differences in attitude exist between brighter and duller streams in secondary schools. The lower streams in the first and second years recorded more favourable scores than the brighter streams but by the fourth year, the duller streams showed less favourable attitudes than the brighter streams. Loukes (1961) came to similar conclusions and showed that boys have less favourable attitudes than girls and that a relationship exists between church going and favourable religious attitudes. Johnson (1966) also found adolescents to have a significantly less favourable attitude to religion than younger children and boys were less favourable than girls.

Many researches have pointed out that at adolescence some choice appears to be made. Certainly many religious authorities ask for a choice at adolescence: Confirmation, free church membership, and the Jewish presentation take place, for the majority, at adolescence. Unfortunately most children appear to turn from religion to a vague, ill-defined belief in God, involving magic and misconception, which rarely carries any spiritual implications.

Marrying the findings of research into the religious development of the child and the findings of research into the religious attitudes of the child, it would appear that children, while at a pre-formal operational level of religious thinking have a relatively favourable attitude but as soon as they move from the magic and fantasy involved at that stage along the road which should lead to mature religious abstract thinking, their attitudes become increasingly unfavourable until the fully mature level is reached.

This then is the problem posed and it was the object of this research to discern levels of maturity in adolescent religious thinking if such levels exist and to discern a possible relationship between those levels and favourableness of attitude to religion.

2. THE DESIGN

The study summarised here was to discover whether the maturity of religious judgement was related to chronological age and whether there was a relationship between maturity of religious judgement and favourableness of religious attitude among children of 13, 14, 15 and 16 years of age.

Population

120 children, both boys and girls, controlled for chronological age were selected as follows:

Group 1.	30 children	13 years of age
Group 2.	30 „	14 „
Group 3.	30 „	15 „
Group 4.	30 „	16 „

The school used was a coeducational bilateral school admitting children from a wide range of backgrounds and environments. The whole ability range was represented in the school.

The religious judgement passages

The method used by E. A. Peel for evoking judgements at the formal operational level was adapted for evoking religious judgements.

- (i) The Bible.
- (ii) Jesus.
- (iii) Love.
- (iv) Religion.
- (v) Temptations.
- (vi) Adam and Eve.
- (vii) The Beatitudes.
- (viii) The expression of Jesus' way in man.

These were considered appropriate areas since they are specifically religious, widely representative of religious education in secondary schools and thought provoking for the adolescent.

Two methods of presentation were used. Passage (v), (vi), (vii), and (viii) were presented as straight-forward passages of connected prose taken from sources designed for use with adolescents.

A completely open question followed each passage, for example, 'What do you think about this?' and then a further question asking for reasons for the answer given to the first question, 'Why do you think this?' This gave freedom for a wide variety of response which, bearing in mind the nature of the subject, was felt to be important.

This method of presentation is referred to as *FREE*.

Here is an example:

Jesus said,

Who are the happy people;
Your poor people,
you belong to God

you who are hungry now
you shall have food;
you who are worried now,
you shall laugh.

Why are the unhappy people?
you rich people,
you have your good time
you who have plenty to eat now,
you shall be hungry;
you who are laughing now;
you shall be worried and sad.

What do you think this means?

Why do you think this?

A sample of replies in ascending order of maturity is as follows:

'If you believe in God everything will be fine, because it does not happen.'

'This means that all the poor people will have food and all the rich people will find out what it is like to be poor because that is what it says.'

'That not only the rich people can be happy, it is usually the opposite. You can go straight out and buy it because it happens to me when I have to work to buy something I appreciate it a lot more than if I ask my parents for it.'

'This means that although one may be rich in material things one is not necessarily happy as those who can appreciate better things to come. This is really where the old saying "money can't buy everything" comes in. There is a certain truth in this as one's happiness comes from a healthy mind where one does not want everything but the more one has the more one wants and cannot appreciate the love of God to the full.'

Topics I, II, III and IV were considered suitable for presentation in the method used by de Silva (1969). Passages were chosen in which the topic word or concept appeared once. The topic was then coded by a nonsense word. The subjects were then asked after each passage, 'What is . . .?' and then 'Why do you think so?'

This method of presentation is referred to as *CODED*.

Here is an example:

Christians believe that when XENOTA lived God spoke our language, belonged to our world, told us about himself and made friends with us. God is not like a number: He is like a friend and he did what every friend must do, He lived at our level. Previously man had looked at the stars, the sun, the oceans and the harvest fields and said, 'God made them all'. Previously man had heard the voice of conscience saying, 'You must', and he said, 'Here am I, Lord, I will do it', and man wondered and tried hard to believe in the friendship of God but when man saw the way he lived and the way he died, man said, 'Now we are sure that this is God'.

Who is XENOTA?

Why do you think this?

A sample of replies in ascending order of maturity is as follows: 'A man who lived when God spoke our language. Because I believe what it says in the paragraph above.'

'I think Xenota was a public figure who convinced people that God really existed. I think this because it says that when Xenota lived God spoke our language.'

'Xenota is Paul, one of the apostles who spread the word of the Lord around the world and convinced people that God spoke their language. I think this because Paul had a certain way of proclaiming the word of the Lord and people could understand his feelings of God and how God created the heavens and earth.'

'Christ. From the passage Xenota is an important person from the scriptures. The most important I can think of is Christ. As the Son of God it was he who was nearer to God than any other of the prophets and so more able to be the friend and guidance according, I think, to what the bible records for us; also the last point about the day he died, the death most famously remembered is that of Christ, not only for his sacrifice but his supposed to have risen again. This may have been the reason for the christian saying "Now I am sure there is a God."'

The Attitude Scale

To test attitude to religion an attitude scale developed by Hyde (1959) was used. This is an equal appearing interval scale of the type pioneered by Thurstone (1929) but allowing a degree of response to each item on a five point scale. The creation and standardisation of the test is described fully in *Educational Monograph VII* 1965.

3. THE RESULTS

The Passages

The passages were chosen to bring out the religious thinking of adolescents. The subjects were required to reason logically using the material in the passages as a starting point. The judgments evoked were graded to the following criteria.

a Logically Restricted

These immature responses were of various kinds and marked by irrelevance, contradiction and a general lack of comprehension. Literalism as truth of fact in entirety and single unexplained doctrinal statements were also included at this level.

b¹ Circumstantial

An analysis in terms of one aspect of the given data taken from the context and used to make inferences about the whole situation marked this class of response. Some reference was made to truths of value although truths of fact tend to dominate the answers.

b² Logical Possibilities

This class of response was marked by an analysis in terms of more than one aspect of the presented material. Some ability to combine the aspects was shown but no account was taken of all the facts presented although the responses tended to be in harmony with the sense of the passage. Truths of value discussed almost in entirety.

c Logical Deduction

A general methodical exploration of the whole passage was shown here. The essential elements of the passage were taken into account. Inferences outside the passage were common in this category.

The judgments were scored as the following scale:

	No response	0 marks
a	Logically restricted	1 mark
b ¹	Circumstantial	2 marks
b ²	Logical Possibilities	3 marks
c	Logical Deduction	4 marks

This meant that a subject could score a maximum of 16 marks if he gave a 'C' level answer to each of the four coded passages or to each of the four free passages.

To minimise the undoubted subjective element involved in the grading of the answers to the passages, an independent assessor,

unaware of the allocated gradings, also graded the answers. Disputed gradings were assigned to the average between them as the final grading. Where only one point difference existed then the higher grading was allocated.

The Attitude Scale

The attitude scale yielded a mark ranging from 0 to 16. Higher scores indicated a more favourable attitude to religion.

Analysis

The following table shows the total scores for each age group for each type of presentation.

TYPE OF PRESENTATION

	Coded	Free	Total
13 yrs.	197	183	380
14 yrs.	218	189	407
15 yrs.	248	230	478
16 yrs.	323	248	571
	986	850	1836

These scores were analysed for the significance of differences in relation to age and type of presentation.

Briefly they showed:

1. a significant difference at the 1% level in the response of the whole population to the passages according to age;
2. a significant difference at the 1% level in the response of the whole population between the coded and the free presentations;
3. a significant difference at the 1% level in the whole population between the type of presentation and chronological age.

The direction of these differences can be seen from the following tables of means.

CHRONOLOGICAL AGE GROUP

Mean		13 yrs.	14 yrs.	15 yrs.	16 yrs.
Judgement	Coded	6.50	7.26	8.26	10.76
	Free	6.10	6.30	7.66	8.26

The mean attitude for each age group was as follows:

Positive attitude Mean	13 yrs.	14 yrs.	15 yrs.	16 yrs.
	5.86	5.16	4.16	6.6

A Pearson product moment correlation coefficient for the results on the coded passages and the attitude score for the whole population resulted in $r = 0.186$, Sig. at 5% $n = 120$.

A Pearson product moment correlation coefficient for the results on the free passages and the attitude score for the whole population resulted in $r = 0.284$, Sig. at 1% $n = 120$.

4. DISCUSSION OF RESULTS

The main intention of this study was to sample various areas of the religious thinking of adolescents. The method chosen to evoke such thinking was a wide variety of passages of connected prose involving religious topics. The major problem with this method is the doubt that the verbal judgments written by the subjects were a true reflection of the thinking process.

On the free passages in particular it was rare to find a consistent level of responding to each passage by any individual subject. The passages were chosen for their variety of content, difficulty of text and type of topic and therefore this was not an unexpected result.

The passages did perform their function adequately but there were variations in the spread of the level of judgment they evoked.

The doctrinal statements classified in the 'a' category were few. This may have been due to the tendency of Religious Education to move from a doctrinal standpoint. The classifying of unexplained doctrinal statements as 'a' level judgments was justified by the belief that in the main they were rote-learned responses. However this does not preclude the fact that some doctrinal statements may have been the result of a reasoning process and thus worthy of a higher category than 'a' level.

A surprising number of answers involved a personal factor relating the hypotheses to a personal experience. This might appear to have been egocentricity but in many cases there was no lack of appreciation or ignorance of some of the competing solutions or possibilities. This served to underline the importance of personal experience in studies concerned with religion and this importance should not be minimised. This is an area sadly lacking in research.

Given the previous considerations with regard to the passages, age differences revealed a significant difference in performance in a progressively rising score from 13 years to 16 years. Peel (1962) found this in his *Brave Pilot* and *Jane* passages. Among other researchers into school subjects de Silva (1969), History and Rhys (1965)

Geography, also found this significantly rising score with age. Goldman (1965) also found a progressive change.

With religious judgments few subjects appeared to achieve the highest levels. Most subjects appeared to be at the b^1 , b^2 stage where truths of value compete on less than equal terms with truths of fact.

The coded passages produced a significantly earlier more mature level of judgment than the free passages. This was not surprising when the content of the coded passages was considered. They were, concerned with basic concepts to which most Religious Education at the secondary level is directed. The passages by their very nature, also abounded with contextual clues.

The free passages presented a rather different and more difficult problem. The subject was required to locate the problem, analyse it and then produce a solution. The impression gained from the responses to the free passages was that the subjects did not know where to locate the problem or its essential elements. They could not define the problem.

The results of the attitude test confirmed the findings of other researchers, Loukes (1961) that there is an increasingly unfavourable attitude to religion during adolescence towards the fourth year of secondary school, and then it improves. The results of the correlation between favourableness of religious attitude and maturity of religious judgment suggests that this improved attitude after the fourth years has some relationship with the higher levels of judgment. The nature of this relationship can only be speculated upon and further research is indicated. It would appear that as children's religious judgments are maturing from a literal, magical stage to a higher formal operational level attitudes become increasingly less favourable until that mature level is achieved.

Hyde (1959) found that junior school children had a favourable religious attitude. By virtue of the maturational process they are happy in their acceptance of a magical, miraculous religion. This becomes unacceptable to them during adolescence when formal operational modes of thinking develop and they start comparing their old religious ideas with the actual reality of life and look for evidence to support those ideas. Consequently their attitudes become increasingly unfavourable until the transition to the mature formal operational level is made.

The nature of religious belief as accepted by younger children may present a case for the removal of Religious Education as it is

conceived at present from the primary school curriculum since the religious concepts held by younger children as a result of their mode of thinking may serve to obstruct their later Religious Education at the secondary stage.

To assist adolescents to progress through levels of formal operational thought ought to be a major aim of the secondary school. The approach to Religious Education would appear to be one that encourages competing solutions to religious problems. Loukes (1961) suggests that discussion is what is required. There may be value in such an approach since it does allow a gathering of suggestions and thoughts; the raising of competing hypotheses and the gathering of evidence in favour of acceptance or rejection.

Further research into the role of literalism in religious judgments may also produce some interesting results. Many of the low-level judgments were wholly factual, seizing on the magical or extraordinary events that occurred. In many cases truths of value were not even considered. The non-miraculous and factually possible was accepted quite happily.

Intelligence may be another area worthy of study in relation to religious judgments and attitudes. The correlation coefficients for the relationship between the attitude and the religious judgment levels are typical of coefficients for ability tests and attitude tests. Hyde (1961) found that 'C' stream children in secondary schools show a more unfavourable attitude towards religion than 'A' streams.

There are obviously importance factors worthy of considerably more research where religious judgments and attitudes are concerned. An adolescent cannot make an honest decision as to whether he accepts or rejects any faith if he is unable to make a mature judgment about the material of belief.

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CHAPTER VII

THINKING ABILITIES AS OBJECTIVES IN CURRICULUM DEVELOPMENT

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ON objectives for the new curriculum Hirst suggests, 'First, we need to plan to achieve certain particular attitudes and qualities of mind which we have not previously emphasised half enough. I am thinking here of an attitude of critical questioning, a more exploratory approach to solving the practical problems of everyday life, an open attitude to social change, a desire to take personal decisions on rational grounds, and so on' (1967, p. 77). Taba states, 'One scarcely needs to emphasise the importance of critical thinking as a desirable ingredient in human beings in a democratic society . . . people need to learn to think' (1962, p. 215).

Such views as these are widespread in the educational literature, yet what is the evidence of their implementation as curricular objectives? Reporting upon the results of such researchers as Getzels and Jackson, Torrance and Calvin Taylor, Vernon (1964) finds, ' . . . not only our current intelligence and attainment tests, but also the whole educational system tends to favour the conformist mentality, the pupil or student who is good at amassing facts, accepting what his teachers and lecturers tell him and thinking and writing along conventional lines.' Thouless refers to ' . . . training pupils to produce the "right" answers, with relative neglect of the type of intellectual activity which explores new possibilities and looks for original answers to intellectual questions' (1969, p. 271). As Taba says, ' . . . the major objective still is to "cover" subjects' (1962, p. 179).

'Traditionally', writes Goodlad, 'teaching has been a "telling" procedure. In general, students have not been encouraged to explore, invent, discover and create' (1966, p. 103). Yet the interpretation of results from the factor analytical studies of many researchers suggests that the ability to sense problem areas, to be flexible in each of several

ways and to produce new and original ideas tend to have little relation to tests used to measure intelligence (e.g. French, 1951, Guildford, 1959a). According to Hudgins, 'Intellectual activity cannot flourish under circumstances which demand rigid conformity. When insistence upon the completion of tasks within specified limits of time, for example, takes precedence over consideration for the pupil who desires to reflect upon problems, perhaps to explore alternative means of solution, restriction in the flexibility of pupils' behaviour must be anticipated' (1966, p. 29).

In five countries—the U.S.A., Germany, India, the Philippines and Greece—Torrance (1965) found strong disapproval of question asking, getting pre-occupied with tasks, having the courage of one's convictions, being independent in judgment and thinking, willing to take risks and unwilling to accept authority's dicta. On the other hand, these cultures seem to lavish unduly great rewards for being courteous, doing one's work on time, being obedient and popular or well-liked by one's peers and being willing to accept the judgments of authority. As Torrance remarks, quoting Plato, 'What is honoured in a country will be cultivated there'. In contrast with conformity, Crutchfield (1962) finds that it is the independent thinkers who are able to function effectively under stress. They are, as he puts it, 'relatively unsusceptible to generalised anxiety, relatively free of feelings of inferiority and inadequacy, open and free in emotional processes, ascendant in relations with others, persuasive, able to mobilise resources easily and effectively, active and vigorous, natural and free from pretence, expressive, able to seek and enjoy aesthetic and sensuous impressions.'

Bruner (1959) paints a somewhat gloomy picture concerning the extent to which elementary school teachers in America encourage or permit children to think. The difficulty of permitting spontaneity, initiative and creativity in the classroom while maintaining control is described by Henry (1959). Henrickson and Torrance (1961) have examined a number of research findings for their implications concerning school discipline. The problems of social and intellectual discipline arising in a more permissive atmosphere have still to be resolved, especially at the Secondary level.

Sanders (1961) raises the question of diminishing curiosity and enthusiasm for learning as children proceed through school, and wonders whether the schools are actually to blame. Sanders, and many before him, (Boraas, 1922), Brandwein (1955), have viewed the

intellectual curiosity of the teacher as a possible determining factor. Teachers are disconcerted when unexpected solutions are proposed by pupils. There is a strong temptation to tell the child, 'what is best,' in order to save time (Sanders, 1961). Children at times see relationships and significances that the teachers and even professionals in the subject matter field might miss. Children ask questions that the teacher cannot answer (Hohn, 1961).

In their traditional role, teachers may feel guilty in allowing children to guess (Bruner 1960), Hohn (1961), and teachers have many devices for putting the curious child in his place (Torrance 1962). Taking a perspective view, Thouless writes, 'It is clear that there are factors in the classroom situation which are inclined to prejudice the teacher against the appearance of spontaneity, initiative and creative ability, among his pupils. Perhaps the most obvious one is that discipline and order can be most easily imposed by the discouragement of spontaneity. It is also the case that testing of the educational progress of children is easier if what is measured is their success in giving the one right answer rather than how far they have produced good, but unexpected solutions to a problem. The pressures in the direction of producing conformity are strong; it is well that teachers should be aware of them so that they may be able to relax their pressures, if they think it important to encourage spontaneity and divergent thinking' (1969, p. 281). A further inhibitor is the work-play dichotomy which appears to be deeply ingrained in our culture and teachers may feel uneasy about the pleasures that children derive from creative experiences (Schafer 1958), Maslow (1956), McPherson (1960). In a study of the question-asking behaviour of teachers, Burkhart (1962), found that the majority of his sample were unequal to the task of asking divergent questions. In some cases, they produced lists of 40 or 50 unfailingly convergent questions. They realised they were doing so, but could not break their set. Torrance and Hansen (1965) report that over 90% of the questions asked by a sample of junior high school social studies teachers called only for the reproduction of textbook information.

There appears to be an ever-widening gap between the school curriculum and the future needs of the pupils. Goodlad remarks, 'Teaching each field as a discrete entity raises some questions as to whether the subject matter is meaningful to the adolescent or whether his schooldays and the rest of his life remain worlds apart' (1966, p. 15). Certainly the choice of subjects and the content would appear

to be an arbitrary decision. This leads Goodlad to ask 'Is there something of a more basic nature . . .' (p. 16).

Knowledge in a subject field is under continuous change. Many of the facts of a subject undergo transformation, or are superseded by new ideas over a relatively short period of time (Bloom, 1969). Moreover, it is difficult to prophesy as to which of the facts are targets for redundancy, due to advances in the subject field. It is hardly surprising that the treatment of subjects in terms of the facts to be remembered is now under heavy attack. The greatest environmental influence for change in America appears to have stemmed from international rivalry in such areas as armaments, atomic energy and space exploration. Winds of change in America inevitably influence thinking in this country, where we have the added pressures for change from ever-increasing world competition in our vital export trade. As Hunt (1961) points out, '... ours is a technological culture of increasing complexity. Its development continually demands an ever larger proportion of the population with intellectual capacity at the higher levels'. This is 'one of the major challenges of our time' (p. 363). What we need, according to Bartlett, is adventurous thinking, 'getting away from the main track, breaking out of the mould, being open to experience, and permitting one thing to lead to another' (1958, p. 203).

When change comes fast, individuals cannot depend upon routinised behaviour or tradition in making decisions (Taba, 1962). For the individual, it becomes a problem of sorting out the apparent chaos of our environment into something like order (Dienes and Jeeves, 1965), yet it seems that whenever possible we try to avoid thinking. Miller (1956) has suggested that thinking occurs only when memory is not perfect. Vernon (1956) goes so far as to say that, 'the majority of people in ordinary life resort to "intelligent reasoning" only if the "quasi-inferential type of thinking" has proved unsuccessful'. That is to say, we fall back upon the familiar modes of response to stimuli (recorded habits) and only when these have been tried and proved inadequate, are we prepared to re-organise our ways of looking at perceptual material or at problems and get down to the job of thinking. In Miller's (1956) view, 'some of the most characteristic features of our thought processes are attempts to circumvent the narrow limits of immediate memory'.

The great problem, as Dienes and Jeeves (1965) point out, is 'how to encourage subjects to move from a strategy like the memory

strategy, which is bound to fail when the information input reaches a certain load, to strategies which involve thinking'. Also, 'How can they be prevented from ultimately being swamped by the information and so rendered unable to cope with the problem at all?' As Hunt sees it, 'The problem for the management of child development is to find out how to govern the encounters that children have with their environments to foster both an optimally rapid rate of intellectual development and a satisfying life'. Presumably this is what Taylor (1968) had in mind when he extrapolated from the early work of Spearman (1927) and the more recent work of Hebb (1949) towards ways in which the curriculum can contribute to the nurture of intelligence (pp. 85/16).

In a discussion of the etiology of changes in thinking, Peel, following Piaget, suggests that the factors involved are maturation, experience, communication and instruction and the urge in every individual to come to intellectual terms with his environment (1965, p. 177). Clearly several of these factors, come within the school mandate.

Taba believes that if thinking were stressed in the various subjects and the differences in the processes of interpretation and application according to context were made conscious, comparative training in thinking would become a matter of course. 'Effective and consistent training is possible only if the whole gamut of decisions, ranging from the selection and organisation of content to the choice of materials and the method of asking questions or of marking examinations, are focused continuously on this objective' (1962, p. 220). More specifically, Taba states, 'Presumably the most valuable contribution of a field of study lies in generating certain disciplined methods of forming questions, developing logical ways of relating ideas and following a rational method of inquiry. Because the greatest need in the scientific age is for persons who can use their minds as well as their knowledge and who can apply their knowledge to new problems, systematic thought needs to be given to the ways and means by which the acquisition of knowledge simultaneously becomes also a method of inquiry and a method of thinking' (1962, p. 179).

Bartlett (1958) regards thinking abilities as intellectual skills that are trainable by analogy to psychomotor skills. The intellectual skills are generalised as well as specific: a manipulation of symbols into organised sequences and structures. Agnew (1922 a,b) who studied composers, reported that they testify to the fact that they

gain control over their auditory imagery through practice. Rossman (1931) suggests that even high aptitude can be made more effective with training of the right kind. Parnes and Brunelle (1964) in a review of 40 studies of programmes for teaching students to improve their sensitivity, fluency, flexibility, originality and elaboration, reports some 90% of the total number indicate that subjects' creative production levels were significantly increased by deliberate education programmes.

A small, yet business-like study aimed at improving skills, strategies and attitudes towards problem-solving was conducted with fifth and sixth grade children by Covington and Crutchfield (1965). They prepared a number of programmes which presented simplified detective or mystery stories in cartoon-illustrated booklet form. A lesson a day was given, over a period of three weeks, each lesson posing a single mystery which the child was to solve. A story line was used throughout the lessons by developing a narrative between two schoolchildren (Jim and Lila, brother and sister) as they learned to become detectives by taking lessons from their uncle.

The students worked through the problem in concert with Jim and Lila, first overtly generating their own questions and ideas, before going on to see how Jim and Lila responded. A succession of clues and additional information gradually emerged as the plot thickened, so to speak. Each lesson was self-administered and self-paced. A very extensive battery of criterion tests was employed. These included problem-solving tasks, such as thinking of ways a man could extricate himself from a deep pit without any tools. They were also tests of divergent thinking based upon Torrance (1962). There were also attitude tests and various self-evaluative measures. The treatment group markedly outperformed the control children in each of the measures of effective thinking. The differences were reported to be 'large in absolute magnitude, far beyond mere statistical significance'. Crutchfield (1966) adds the rider, 'it may be that almost any honest, intelligent and direct effort made by the teacher to arouse and guide the children's interest in problem solving, and to give him ample opportunities to practice it and to discover that he can succeed in it, will produce substantial gains'.

The attractiveness of this method is that, being auto-instructional, it can be readily incorporated into any existing school curriculum. Remedial programmes could be available to individual pupils. Crutchfield's research was generalised as regards subject matter.

but fairly specific as regards the cognitive factors and processes involved. Again adopting a programmed approach, Stones (1965), using as subjects 104 girls in grammar, technical and secondary modern schools, gave the experimental groups lessons based upon underlying concepts. She then set a series of exercises in which the children were required to answer questions based upon historical passages. The pupils' responses were marked according to the thought processes displayed rather than on their factual content. The results favoured the 'treatment' group.

The literature abounds with reports of studies, many quite ingenious, which claim to have improved pupils' thinking. Anderson (1967) found that the freely-written responses of girls was improved by first giving practice on multiple choice items. These practice tests gave experience in such relationships as combinative and qualitative classifications, probabilities, correlations, multiplicative compensations, etc., and they were designed to train children to solve problems of disjunction, conjunction, implication, incompatibility and so on.

Cartledge and Krauser (1963) gave a group of children five 20-minute sessions on thinking how they could improve toys. The treatment group subsequently gained significantly more than the control group in scores for fluency, flexibility and originality using Torrance-type tests. McFee (1964) randomly selected a group for special art training. This included the solving of design problems and instruction on principles of perceptual organisation, spatial relationships in 3-D space and the nature of creative thinking. The results showed significant improvements well beyond the field of art. Osborn (1963) used an interesting 'check-list' question-asking technique. Crawford (1954) employed an 'attribute-listing' technique in which one first describes an object or situation in terms of specification, limitations, needs, etc., and then suggests possible improvements. The check-list and attribute-listing methods have been systematically combined by 'morphological analysis', named and used by Zwicky (1957) and advocated by Allen (1962).

Two examples have been extracted from the Polish educational psychology magazines, which contain helpful summaries in English. Kalmykova (1964) proposes that a series of coefficients are needed in the diagnosis of methods of child development in problem solving. This could well provide a basis for a critical path analysis. The 'economy coefficient' might be concerned with the relationship

between the actual and the logically essential number of stages of reasoning leading to the solution. Other indexes might be the 'stock of active knowledge' and 'rate of progress'. Koziellecki (1965) has been concerned with the role of programmes that simulate thinking and problem solving. Koziellecki regards programming as a new way of constructing an unambiguous and complete theory of thinking which may play an important role in psychology in the future. His steps recommended in making of a programme are:

1. Study the principal features in human thinking.
2. Construct a heuristic programme.
3. Investigate its validity, i.e. does it really simulate human thinking.

Karlins and Schroder (1967) claim that, 'Used in conjunction with a complex learning problem, the I.T.P. provides material to the student in a way that permits him to generate higher level plans or strategies for making decisions, based on the consideration and comparison of self-gathered units of information' (p. 867). I.T.P. stands for Inductive Teaching Program. It is an emphasis on decision-making through 'student-instigated inductive reasoning'. It provides the learner with basic units of information necessary for decision-making, while requiring him to accumulate and process the information in self-meaningful and relevant ways for problem solving. The student is active at every phase and is self-paced.

Once again we meet up with the idea of providing the learner with a rich environment to explore and manipulate, receiving feedback relevant to and based upon his behaviours. This surely is the cybernetic model of a systems approach, currently in vogue in programmed learning circles? The I.T.P. comprises a set of facts about a specific problem, situation or academic subject, stored on individual cards, 'Analogous to the memory storage banks utilised by computers'. The student is charged with the responsibility of obtaining these facts by the 'inquiry method': asking questions that will solicit these pieces of information. This would seem to link aspects of problem solving and creativity with a discovery method, in much the same way as that adopted by Suchman (1960a, 1960b, 1961).

'Brainstorming' is perhaps a somewhat emotive term, suggestive of American high-pressure salesmanship. Certainly the works of Osborn (1963), Parnes and Meadow (1959, 1960), and others, do not appear to have inspired much replication of their methods in this country. The basic aim of brainstorming is to stimulate students to think

independently, to test their ideas and to communicate them to others. These investigations have usefully high-lighted certain perceptual, emotional and cultural blocks—inhibitors—to creative thinking. Also introduced is the concept of 'deferred judgment'. This involves the notion of deliberately separating the production of ideas from the processes of evaluating them. The latter is considered to have an inhibiting effect. This is germane to the work of Peel: the evoking of many ideas and the avoidance of the ill-considered, snap judgment which, if not a denial of the premise of the given date, may still fail to take into account all the extenuating possibilities. Osborn gives as examples of perceptual blocks, the difficulty of isolating problems, the difficulty of taking too narrow a view of the problem, the inability to isolate attributes and a failure to use all the senses in observing. Emotional and cultural blocks are the effects of conformity, reliance on authority and fear of making errors.

In one method employed by Parnes the subject is instructed to attempt to solve problems by recording all tentative solutions which occur to him, 'postponing judicial evaluations of those solutions to a subsequent time period'. Meadow and Parnes (1959) report resultant increases over the control in productivity in 5 of 7 tests of creative thinking. Parnes and Meadow (1959) found significantly more good quality ideas were produced under brainstorming as well as a greater quantity of good ideas. An interesting finding here was a positive correlation between quantity and quality of ideas.

Peel realised (1967) that the range of answers obtained to his thinking problems, outlined in the first paper in this issue, could be used as a means of instructing the pupil in good thinking habits. This he suggested could be obtained by using the range of responses in a branching type programmed learning sequence. Where a person gave an immature response, the sequence followed would differ from that provided for a learner who gave a mature response.

An experimental study (Gray, 1970) was conducted on these lines in a large co-educational school in an attempt to demonstrate the use of programmes as a means of effecting a recognisable improvement in cognition, as measured by performance in tests of thinking and judging. The programmes used were administratively flexible and involved little, if any, teacher time and attention. It was also fortuitous that the programmed approach is also a method advantageous as a psychological research tool (e.g. Baker, 1963) and that pro-

grammes have many formal aspects similar to those in mental testing (Jacobs, 1962).

A total of 86 pupils in the 11-12 age group were involved. The treatment consisted of five programmes in booklet form. These were studied by pupils individually, roughly on the basis of one programme per day, each taking no longer than one lesson period. Pupils were encouraged to respond overtly to the programmes by making their own notes and written comments. The approach, through the verbal logic of a branching programme using multiple choice questions, was

- (a) to indulge the child's current level of thinking on the particular topic long enough for him to become aware of his limitations;
- (b) to lead the child deliberately into the next higher level of thinking by challenge, argument, the production of further information, and so on;
- (c) to encourage, at the hypothetico-deductive stage, a consideration of all possibilities and the subsequent discarding of those unwanted;
- (d) to encourage divergent thinking—the production of many ideas—yet also to provide opportunities for the convergent thinking involved in carrying an argument to a conclusion.

This treatment was followed by a battery of tests, the principal items of which were open-ended questions relating to comprehension-type passages as adopted by Peel and numerous studies inspired by Peel (e.g. Peel, 1966; Rhys, 1965; Davies, 1965; Byde, 1970).

Pupils' responses were firstly matched against three general levels of maturity of thinking:

- a tautological
- b circumstantial
- c extenuating possibilities.

After subdivision, five categories were recognised, namely

a, bⁱ, bⁱⁱ, cⁱ, cⁱⁱ (from Peel, 1966).

An analysis of the results showed a significant difference between treatment and control groups at the 1% level in all but one instance.

This result may suggest a worthwhile research area in which to consider the possibility of moving towards an educational policy aimed specifically towards maximising thinking abilities in pupils. It is suggested also that the principles of programmed learning may prove efficacious to such a purpose.

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BOOK NOTICES

ASSISTANT MASTERS ASSOCIATION, *The Teaching of Economics in Secondary Schools* (Cambridge U.P., 1971, 181 pp., £2).

ECONOMIC theory teaches that monopoly is, generally, a bad thing. Since there has only been one general work concerned with the teaching of economics in this country, ed. N. Lee, *Teaching Economics*, 1967, the long-awaited volume from a Committee of the A.M.A. could count on a ready welcome. Moreover, a first glance at its chapter-headings would indicate little overlap between the two manuals, such titles as 'Objective Testing' or 'Mathematics in Economics' in the new one promising also due attention to most recent and topical issues. But it may as well be stated at the outset that the quality of the present book falls sadly short of its promise.

True, there are useful insights, suggestions and examples in the chapters mentioned above. There are, further, several syllabuses proposed or reproduced from practice that will be of real value to teachers of economics at different levels and within a variety of courses. And there is no shortage of sound and sensible advice scattered through the pages of the book, e.g. on the principles and problems of homework—a strangely under-investigated dimension of schooling which absorbs millions of teacher- and pupil-hours annually, or on the importance of books and reading (though one wonders if 'the 6th former must . . . above all know his basic textbook from cover to cover'), or on the employment of visual aids.

But the other side of the coin of commonsense is the book's uninspiringly exclusive concern with the practicalities of the classroom which makes it so pedestrian as to be at times flatfooted. Hence its patronising-didactic tone, as in the chapter on 'Economics as a Social Study for All Children' where most paragraphs begin 'Talk about . . .' or, elsewhere, a Mrs. Beeton-like 'Try a little elementary statistics'. Hence the lack of originality of thought and occasional platitudes or even non-sequiturs like: 'It is strange that we should claim that economics is a social science, yet have done little to make use of the techniques used by the teachers of the physical sciences', p. 42. And a work that is strongly examination-oriented should show the courage of its authors' convictions and refrain from several disclaimers of this perfectly justifiable orientation.

A more fundamental criticism of the book, however, is that it is dated in its overall conception. It is dated in its assumption that virtually all teachers of economics are untrained and many academically unqualified in the subject, and that this situation will continue (the air of discovery when the Committee confide in us that 'in general we find it desirable

to relate things to the pupils' own experience' is more annoying than amusing). It is dated in its unawareness of—or, at any rate, utter neglect of references to—recent researches in economics education. This, presumably, accounts for its bland advice that when some 6th formers have and others have not taken 'O' level economics previously, 'the most workable solution may well prove to be to assume that no one has studied the subject', at a time when university departments of economics have for years been increasingly exercised by and trying to resolve an analogous problem in respect of freshers with and without prior 'A' level economics. And the dated conception of the book seems to have affected even some factual information: banks ceased to open at 10 a.m. and close at 3 p.m. several years ago, and the bibliography recommends the 1965 version of Sampson's *Anatomy of Britain* and Unilever's defunct magazine *Progress* (just why the Bibliography follows 5 pages of references on economics with 6 pages relating to British Constitution—still managing to omit in the latter section Blondel's excellent and stimulating *Voters, Parties and Leaders*—is puzzling indeed). In the last resort, for all its references to matters of current interest, the present book seems in its tone and intent like an inflated version of the Economics Association's pamphlet on *The Teaching of Economics* which met with a mixed reception ten years ago. And, given the growth of economics education since, what was passable in a pioneering effort of 1961, just will not do in what purports to be an authoritative manual of 1971.

R. SZRETER

IVY PINCHBECK and MARGARET HEWITT, *Children in English Society: from Tudor times to the Eighteenth Century* (London, Routledge and Kegan Paul, 1969, £2.80).

THIS comprehensive work deals with children at home, at school and at work; with the child as a member of a family, as an orphan, as a vagrant and as a delinquent, taking in en route the children's workhouse movement, the boarding-out system, schools of industry, as well as the traditional endowed grammar school of the sixteenth century and the class-based elementary school of the eighteenth century.

The book is full of fascinating detail culled from contemporary literature, and serves as a salutary reminder that the formal education of children in school played a relatively slight part in their upbringing. The section on the education of children in school is, however, the weakest part of the book. It has a dated air about it with little or no reference to recent historical discussion of the period in question. Indeed, the bibliographical list of 'Twentieth Century Publications' of some 80 items has only two works with a publication date after 1960, and neither of these receives more than a passing reference in the text.

More important, however, we have to ask in what way if at all the work is to be counted as 'a contribution to the literature of historical sociology' (the claim is made in both the Preface and the Introduction), for it is innocent of theory, of hypothesis-forming and -testing and of quantification. That the book is based on historical materials is undoubted, that it treats these in a sociological manner in accordance with sociological tenets or theory (of whatever school) is almost certainly to be denied, which is curious coming as the book does from two professional sociologists. The book of course has a theme, that attitudes to the treatment of children changed for the worse from the sixteenth to the eighteenth centuries, but the explanation of this change, that children came to be thought of as economic units, is far too simple to account for the myriad details which the authors provide. Indeed the work's reliance on printed contemporary literature tends to over-emphasise what various writers thought should be done rather than what in fact was done to and for children in the long period under discussion.

The book provides a convenient collection of data about children in English society but not very much more.

KENNETH CHARLTON

W. A. L. VINCENT, *The Grammar Schools: their continuing tradition 1660-1714* (London, John Murray, 1969, £3.50).

DR. VINCENT continues his studies in seventeenth-century education, begun in *The State and School Education 1640-1660* (1950), with an attempt to test the validity of general assumptions about the decline of many grammar schools in the eighteenth century. The period he now treats, 1660-1714, saw 'a flight from the endowed schools' and is characterised as one of 'educational depression' (following Lawrence Stone). Dr. Vincent discounts the oft-quoted Hobbesian argument that this was due to criticisms that opposition to the king during the Civil War period had been led and furthered by the products of the endowed schools. Much more important were a general dissatisfaction with a wholly classical curriculum, the indifference, inefficiency and downright dishonesty on the part of teachers and governors alike, the competition of private schoolmasters, but above all a poverty arising from inflation which reduced the value of endowments, encouraged the introduction and raising of fees, and restricted the number of free places, all of which very often culminated in the dropping of Latin from the curriculum and its replacement by English—the hall mark of a 'decayed' grammar school.

In the course of his study Dr. Vincent asks a series of questions: did practice in school match the prescription of school statutes? for whom were the schools intended? who were actually educated therein? what were

the qualifications, conditions of work and aspirations of the grammar school masters and their ushers? If the answers to these questions are almost always undramatic and expected, at least the search for the answers has been systematic and the results are clearly presented. Occasionally there is a disconcerting tendency to wander too easily out of the period of the book's title in order to sustain the arguments the author wants to use. More important, perhaps, the book lacks a sufficiently precise discussion of what 'the grammar school tradition' really was, and what it was that was being 'continued'. But generally this is a sound piece of work and a welcome addition to the literature.

KENNETH CHARLTON

J. W. TIBBLE (ed.), *An Introduction to the Study of Education*—An outline for the student (Routledge and Kegan Paul, £1.10).

PROFESSOR Tibble admirably achieves the aims that he sets out in the introduction to his collected set of contributions. He obviously understood the need for a book of this nature, and financially this book is likely to be successful. The contributors have managed to simplify complex concepts and ideas without distorting their true meaning.

Although, for reasons of space, it is difficult to select any of the contributions for particular note, Malcolm Seaborne's historical consideration of live educational issues, and Anne Dufton's systemised essay on 'The Sociology of Education' should prove highly stimulating and useful for the young and inexperienced student. Perhaps my only worry about this book is that some students may well read this alone and, with a smattering of jargon, successfully negotiate the examination hurdles.

F. M. HILLIARD (ed.), *Teaching the Teachers* (Allen and Unwin, £2.10).

PROFESSOR Hilliard has assembled six contributors, successful and well-known, and much of their material will be of great interest to all those concerned in teacher education.

Mr. K. A. Baird, as a practising Principal, writes from wide experience and with considerable conviction about the administration, staffing and organisation of colleges. His plea for an Educational Grants Committee appears, theoretically, an admirable suggestion, but in hard times H.M.I.s. and Local Authority administrators must be protected from the sceptre of redundancy!

Professor Brown's chapter concerning the B.Ed. degree contains a comprehensive statement of the problems involved, but is a little worrying when he likens the degree to the U.S. Apollo project—possibly an unfortunate analogy when one recalls that three of the Apollo team were killed when the capsule was still on earth!

Mr. Elvin's contribution is both interesting and entertaining, but I imagine that few college lecturers would consider his argument original.

Professor Hilliard deals with the theory and practice of teacher education in a discourse which moves from simplicity to profundity as the chapter progresses. He is well aware that certain aspects of practical theory need to be considered with an eye on the young teachers' foreseeable practical situation, and lecturers in colleges of education will find his views stimulating. Professor Hollins takes a critical view of the structure of courses in colleges of education and talks about the lack of relevant experience of many of the lecturing staff, especially so when two-thirds of students are training for primary school work. He is critical of the inefficiency of the college in the professional introduction to teaching, but his plea for a two-year general course, followed by a one-year professional preparation, would not have gladdened the hearts of the Plowden Committee, though it may well encourage 'James'.

The last contribution, from Mr. J. F. Porter, concerns teaching methods in colleges of education. His indication of the expenditure available for various areas of higher education is interesting and relevant to the problems with which he deals, but much of his material is pure conjecture and no consensus is likely to emerge from his views on team teaching and individual study methods. Knowledgeable, and very able people as the authors are, this book will make less impact than it should, being published as it is at a time of great change. Possibly contributors of such ability would have better utilised their time had they produced a more profound volume, although it might have been less stimulating.

KENYON CALTHROP and GRAHAM OWENS (eds.), *Teachers for Tomorrow* (Heinemann £1.90).

KENYON Calthrop and Graham Owens again follow the recent trend of involving a number of contributors, but in this case the authors are not so well known as the contributors in the previous two books. Its reading, however, may be of great interest in giving an insight into the attitudes of some factions involved in teacher education.

Graham Owens praises the modular system of college organisation, and it may be extremely successful when those involved are motivated towards this form of structure, but many will have grave doubts about this structure in all circumstances.

David Logan's contribution, as the young teacher and ex-Student Union official, disappoints in so far as little of it is involved with the creative development of either student organisation or educational structure.

Margaret Maden gets to the nub of many current problems in colleges

in noting that some students are not really interested in becoming teachers but in being 'exposed' to higher education.

The chapter on the role of the tutor, by Larry Soule, is extremely constructive, and I imagine that many tutors would attempt to follow a similar pattern to the one suggested in the book, but again the module system suggested is not necessarily the best structure for a student programme.

Finally, Francis Cammaerts on the role of the Principal includes much of Professor Taylor's work on the analysis of Principals in colleges of education in the 1960s. This information is well out of date when one considers how many Principals have retired, and small colleges closed, or amalgamated since that work was completed. Cammaerts' assertion that the role of the Principal is largely concerned with trying to retain an interesting dialogue between staff and students will leave many Principals wondering what their jobs really are about!

I suppose that distance and time lend enchantment, but most Principals in this country are now the accountable officers of organisations whose budget may exceed a million pounds per year, and the skills required are quite different in scope from those demanded in the cosy insularity of the sixties. This is not a book which I imagine many will buy, but nevertheless, it is one which many should read. To me, personally, it appears to be a book which has been both hurriedly written and rushed into print. There is a good case at this level for publications to be more scientifically based, especially when relevant data is available.

J. BANFIELD

M. SEABORNE, *The English School; its architecture and organisation, 1370-1870* (Routledge and Kegan Paul, 1971, £7.50).

THIS volume, the first of two, makes an important contribution to the study of the history of education. In it, Mr. Seaborne attempts to bridge the gap, which all too often exists, between detailed local studies and general historical accounts, by making a close study of the relationships between organisational and architectural change during the period 1370 to 1870. This eminently sensible, but previously neglected approach is justified on the grounds that, if educational changes are of real importance, they are likely to be reflected in alterations to the buildings and internal organisation of the schools. The book is important, too, because, by concentrating on 'archaeological' as well as documentary evidence, the author is able to ask new questions, or to look at old ones in a new way. So, for example, when dealing with monitorial school buildings, Mr. Seaborne offers some interesting comments on the effectiveness of the strictures of Bell and Lancaster, suggesting that, in practice, one factor contributing to the greater success of the National Society may have been that Bell's ideas on

school design were more flexible (or perhaps less carefully formulated) than those of Lancaster

In its scope, the book is monumental, and, necessarily, raises issues which it is impossible to resolve fully in the space available. Yet this is, perhaps, a major strength, for this novel approach can be exploited fully only by local historians, who may be encouraged to make fuller and more meaningful use of architectural evidence in future.

The book is well-presented and indexed. The many illustrations are sensibly arranged to follow the text, and the two complement each other neatly. The chapters are well referenced, although some readers may have preferred footnotes and a full bibliography at the end of the volume. One admires especially the exhaustive search the author has made for his photographs, and for the plans of important or typical buildings which are interspersed throughout the text. Its price may put the book beyond the reach of many, but for reference purposes, and as an important stimulus to further research, it should find its way onto the shelves of every serious educational library.

R. A. LOWE

IVOR MORRISH, *The Background of Immigrant Children* (Unwin Education Books, £3.50).

Books about the background of immigrants present a number of problems. To start with there is a feeling that one should automatically be 'for' them and this can make any assessment of their value rather difficult. Never the less an assessment should be made and in doing so it will be necessary to consider certain points about background books in general.

In the preface Mr. Morrish states quite clearly that this is a book to help students understand the problems of immigrant children. His intention is to try and get inside 'the very minds of the members of other cultural groups' so that the students can begin to tackle the fundamental problems of colour, culture and race differences. Mr. Morrish believes that this can be largely achieved by studying the religious situations in the Caribbean and the Indian sub-continent. He devotes a considerable amount of space to this aspect before moving on to social background and education in these areas, concluding with sections on culture contact with the host society. As a study of comparative religion, these early sections are fascinating and there are also useful bibliographies, but it would seem that Mr. Morrish has neglected two important points. The first is why this particular emphasis should be the best way to get to understand the behaviour of all immigrants. The second is the way in which the family in general and the child in particular operate within a religious setting. For example, knowledge that the Baptist church is very influential in the

Caribbean does not tell the reader what attitudes and values a child from this religious background is likely to have.

When dealing with the culture contact with the host society, some of the points that Mr. Morrish makes are, to say the least, over-simplifications. On page 85 for instance, he writes that 'The warmth of the atmosphere (of the Caribbean) is translated also in terms of human relationships.' This type of generalisation is very vague and questionable in sociological terms, but none-the-less likely to be seized on precisely because of its simplicity.

The point about over-simplification is particularly relevant when this or any other background book starts to deal with the concepts of Culture and Society. The difficulties that professional sociologists have in reaching agreement about the nature of these terms are well known. Even if it were possible to get a clear understanding of them it would still be very difficult, some would say impossible, to predict how an individual will behave within a society and what points of reference an outsider should take as being constant. An analysis of the social framework of the immigrant is just not undertaken by background books in anything like enough detail. It is not enough to write that there is no such thing as a typical Indian when a good deal of space is devoted to building up a variety of generalisations about his behaviour. These generalisations will go to form the basis of the student's diagnosis of the problem of an immigrant child in his class. The fact that this child and his family are subject to a whole range of influences—many of them totally unconnected with the original home of the parent—does not seem to be much of a concern in background books.

It would seem that a more fruitful approach to providing a background for our students and teachers would be to pay a greater amount of attention to the social patterns of the immigrants society and how these have been modified by the conditions prevailing in this country. This could be followed by a detailed examination of the difficulties that immigrant children may be experiencing in our urban schools. The problem with this approach is that it would reveal just how little we as educationalists are able to give our students in the way of relevant information about the feelings and aspirations of *all* the children from backgrounds different to our own.

JOHN WORSLEY

FRANK FIELD and PATRICIA HAIKIN (eds.), *Black Britons* (O.U.P., 1971, 132 pp. 40p.)

GARNET MCDIARMID and DAVID PRATT, *Teaching Prejudice* (The Ontario Institute for Studies in Education, 1971, 131 pp. \$2.50).

ONE in a series of Readings for General Studies the first title consists of extracts from a wide variety of sources. The book is divided into four

sections, dealing respectively with the background to immigration; living and working opportunities, education, crime and social services; opportunities and frustrations of second generation black Britons; and race relations legislation. The extracts are, in general, informative and well-balanced.

The reader is soon faced with the interacting human and social problems involved, for example: 'The shortage of workers made West Indians economically acceptable; the shortage of housing made them socially undesirable.' If students are able to check the validity of statements and interpretations of this kind either by reference to other sections of the book or to original sources they will be actively engaged in deepening their knowledge and developing some of the procedures that will, one hopes, enable them to 'think independently'. Although a few are rather brief, most of the extracts adequately fulfil their function as focal points for discussion, comment on key features in the field or as introduction to a deeper study of the issue concerned. This book is designed to deal in a mature way with central questions like, 'What is discrimination on grounds of colour?' 'Does it take place?' 'If so, to what extent?'. The authors do not specifically pose these questions but the reader is bound to consider them and weigh up related evidence and thus be helped in the formation of attitudes of key importance. The section on the Race Relations Act is of particular value. A discussion of the provisions of the Act can be seen in relation to evidence of discrimination, the social and moral grounds for enacting laws of this kind, and the extent to which legislation either by its existence or reliance mainly on reconciliation can bring about changes in attitudes. Apart from fulfilling very effectively its purpose as a balanced collection of materials for general studies, this book could also be of value to any teacher or social worker concerned with community relations.

For many years, as the historical background to *Teaching Prejudice* shows, there has been concern about the adequacy and accuracy of textbook material. Concern for the quality of material presented to pupils is seen as essential to the promotion of 'understanding, tolerance and friendship among all nations, racial or religious groups . . .'. This book is a report of the work of a small group of researchers at the Ontario Institute for Studies in Education who spent two years analysing the content of social studies text-books used in schools in the Province of Ontario.

The problem of bias in communication is not necessarily resolved by replacing discriminatory statements by those that are accurate: it is equally important to ensure that relevant, available material that could result in alternative interpretations has not been omitted. The examination of bias should be concerned not only with untruths, which may be apparent, but also with truths that are unrepresentative. A major initial task was that of developing appropriate quantitative techniques. The study was limited

to six target groups: Jews, immigrants, Moslems, Negroes, American Indians, and Christians, as a control group. The approach used in the analysis of statements about these groups was aimed, primarily, at distinguishing between a simple and evaluative assertion, between a simple statement of fact and a statement involving interpretation that is generally emotive and applied much more often to one group than another.

The procedure used is uncomplicated and easily replicated. Three components are established in any assertion: attitude objects, which refer to people or things about which assertions can be made, connectors, usually a verb, and a common-meaning term, frequently an adjective, which completes the assertion. After references to target groups are identified each connector and common-meaning term is assigned a unit value from which an overall score is computed. On the basis of an analysis of 125 books it was concluded that Christians, Jews, immigrants and Moslems received positive treatment, in that order, and that Negroes and Indians were treated about equally, negatively.

Problems of omission were dealt with by determining, with the aid of experts in the field, a list of issues that could be expected to be dealt with in social studies. Protocols, or outlines, consisting of accounts of eleven of these issues, were then used to assess the extent of inclusion or omission. These protocols were based on material readily available to text-book compilers. Judgment was based on five criteria: inclusion, validity, comprehensiveness, balance and concreteness. Of the eleven 'critical issues' eight were dealt with in an unsatisfactory manner and many were out-of-date or deficient in important respects.

The report's recommendations are uncompromising. Publishers are advised to make appropriate revisions; teachers of social studies should be provided with lists of errata in text-books; if necessary, books should be commissioned 'which provide scholarly and up-to-date information on the history and status of minority groups in Canada and elsewhere. . . . While some work in this country concerned with the portrayal of ethnic groups had indicated that bias exists, a study of this depth has not appeared. The importance of the Ontario project is that it points to bias or omission in a number of areas apart from that of race-relations and could well contribute to raising the level of many texts and other material. This, it is suggested, could happen in several ways: by familiarising teachers with merits and deficiencies of texts, by presenting text-book writers with firm criteria, and by acquainting teachers with procedures that could be used for examining texts. Apart from its value to teachers of social studies this book should be of interest to college lecturers and students. An understanding of ways of examining materials could provide many insights into the subject matter and, additionally, help refine the teacher's objectives.

MICHAEL STANTON

JOAN BROTHERS and STEPHEN HATCH, *Residence and Student Life* (Tavistock, 1971, £5.00).

SUB-TITLED 'A Sociological Inquiry into Residence in Higher Education,' this should prove a useful source for data and objective argument in a field where discussion and theory flourish on remarkably thin factual soil. It is not, however, a wholly satisfying book, due largely to unevenness in the quality and depth of different chapters and the data on which they are based. Nor is the precise scope of the work entirely clear. Throughout most of the book, the word 'residence' means college-provided hall or similar accommodation. Occasionally, though, it is used to mean accommodation of any kind (hall, flats, digs, etc.). The bulk of evidence presented refers to accommodation provided by Universities and colleges of education in their own buildings (and includes an analysis of over 2500 replies to a questionnaire). But the book's conclusions also pronounce on the merits of flats, bed-sitters, 'digs' and home-based study—on the basis of research among only 55 students at Chelsea College of Science and Technology, 10 of whom lived at home. On the strength of this further data, the word 'residence' in the title appears to be intended to bear the wider interpretation—hence the complaint of unevenness.

When dealing with accommodation for students at polytechnics, the data are, of necessity, sparse: official interest is low, and the majority of students are home-based, and usually belong to social groups completely divorced from their place of study; however, the authors fail to note that the minority of polytechnic students who live away from home consists largely of atypical special cases: overseas students, for example. Their conclusions on the costs of residence and relative academic performances in different kinds of accommodation are based on others' data and do not add much to what is already known. In a book which has a lot to say about a student sub-culture it is surprising, to say the least, that there is no mention (apart from a single sentence) of the part played by Students' Unions in developing this culture. To explain the greater ease with which colleges of education, as against Universities, find accommodation for their students, the authors refer to better local relationships and greater discipline, but do not mention the system of direct payments from college to approved landlady, which gives much greater security than the University system where students normally pay for lodgings themselves. Within their area of chief interest, however—that of University and college-provided accommodation—the conclusions are well-documented and effectively presented.

The authors start by emphasising the influence of past history on present-day thinking. Medieval Universities provided their own accommodation partly to meet a shortage of beds in University towns, but also as a disciplinary measure, to contain their riotous students. The philosophy

of University-provided residence as a humanising, socialising force, is a much later development—arising largely from the early colleges of education, who provided residential accommodation in order to rescue their students (almost uniformly working class and very poor) from the handicaps of their background, while providing none of the luxuries that might have tempted them to forget their humble origins.

The failure of the University halls and college residence to achieve their advertised ideological aims is this book's most important conclusion. Motivation and academic achievement of students in residence is somewhat mediocre. 'Socialization' appears to consist of acceptance of the status quo, in the University and in society at large. Graduates who have spent three years in University residence show a stronger tendency than other students to associate with, and eventually to marry, 'their own kind'. That this is due to a paternalistic framework in halls and colleges is only part of the story; possibly the most influential determining factor is the admissions policy practised by many wardens: the authors echo Robbins in arguing that university-provided residence does not usually go to those who need it most.

There are brave words about replacing 'elitist paternalism' with 'participatory democracy' in student residence, encouragement for more home-based students (although the authors note a reverse trend and admit that the home-based student forms few friendships with fellow-students) and suggestions that the present boom in loan-financed accommodation could be encouraged by preferential interest rates. At heart, a book that is sound and well-documented, but over-ambitious in the scope to which it lays claim.

ROBERT HUGHES

Psychological aspects of physical education and sport, edited by J. E. KANE.
(published 9th March 1972, £2.50 net).

IN the developing pattern of physical education, considerable importance is given to the study of psychology and Dr. Kane's book will provide a useful focal point to clarify some of the issues. He has assembled an impressive group of contributors who are well known experts in specialised areas of physical education and psychology and they not only draw attention to relevant research but lay emphasis on the practical implications of these researches in learning and teaching.

A. H. Ismail's opening chapter on integrated development clarifies the relationship between motor aptitude and intellectual performance. In a parallel chapter Dr. Kane examines the circumstances under which personality and physical abilities may be related, laying particular stress on the importance of multivariate and factor analyses in correlating this

area of research. J. N. Oliver reviews research work with handicapped children with reference to the effects of physical activity on mental as well as physical health and he emphasises the need for providing adequate opportunities for implementing this research work in practice.

Skill learning is familiar to most physical educationists, but B. J. Cratty and H. T. A. Whiting open up some interesting aspects of motor learning referring to selective researches in the acquisition of skill and pointing the need for further research in this subject. The area of aesthetics is less easily definable and D. Sandle sets out a detailed interpretation of the psychology of qualitative movement in an informative and challenging way.

For students and teachers who find themselves submerged by the welter of material on psychological research, this book should provide a clearing house for ideas and a strong directive for further study and applied research.

C. ROBERTS

P. DOUGHTY, J. PEARCE, G. THORNTON, *Language in Use*, Schools Council Programme in Linguistics and English Teaching (Edward Arnold, 1971, £1.70).

SINCE the discrediting of, and consequent decline in, formal grammar teaching with its rigid prescriptivism, many teachers of English have been concerned that the hiatus created by the disappearance of tightly-structured grammar teaching has not been filled by a form of language teaching that contributes to the enrichment of children's language competence and production. Most teachers would agree that the emphasis during the last decade on encouraging children to use language to explore personal experience has been salutary, but some teachers consider that in addition to personal writing some more specific, wider-based language teaching is desirable.

The authors of *Language in Use* consider language as an essential part of human behaviour and state the aims of their book as: '... to develop in pupils and students awareness of what language is and how it is used and, at the same time, to extend their competence in handling language.' They consider language awareness and competence as symplectic, with the one having a positive effect upon the other. Rightly, they point out that some pupils 'often find themselves unable to handle language which the processes of explicit analysis and impersonal comment require' and that 'educational failure is often linguistic failure'.

To assist teachers and lecturers in promoting the language awareness and linguistic competence of their pupils and students, the authors of *Language in Use* have produced loose-leaf ring-folders of 286 detachable

sheets of suggestions for language work. In all, there are 110 units of work, grouped into three sections entitled: Language—Its Nature and Function, Language and Individual Man, and Language and Social Man. The units are sequenced in themes and each unit focuses on a single topic. The entire scheme was validated in schools and colleges. Not everyone will agree with the taxonomic process used in the book, but this is to be expected when one is attempting to deal succinctly with an aspect of human behaviour so polychrestic and complex as language.

Flexibility is the key-note of the book, but flexibility has its disadvantages as well as its advantages. The outlines of sequences of work rather than its detailed specification, and the juxtaposition of units undifferentiated as to difficulty-level or age-level presuppose knowledge and discrimination which some teachers of English (non-specialists and the inexperienced, for example) do not have. Dirigible courses are more difficult to produce than flexible courses because more precise knowledge of stages of development and of age-level criteria are required. As the authors themselves say: 'Competence in one's own language is a complex matter, and, as yet, we do not know as much as we would like about the processes by which we acquire language and extend our knowledge of it.'

Language in Use has its faults (e.g. occasionally it over-simplifies; sometimes it is superficial in its treatment and vague in its requirements of teachers and pupils; there is some imbalance between the components of 'awareness of language' and 'language competence'), but it offers a plethora of stimulating, well-considered, seminal suggestions for language work. Teachers of English in most post-primary institutions will find enough material in this book to enable them to construct programmes of language study which will meet the particular needs of their pupils or students. *Language in Use* will do much to improve language teaching in schools and colleges, and to put language back into the time-table as a regular and intrinsic part of English studies. It is recommended to all teachers of English and in particular to those teachers who have not yet based their English teaching on recent findings from applied linguistics.

JOHN SKULL

BRIAN HODGKINSON (ed.), *British Economy Survey* (Oxford University Press, Autumn, 1971, 40p.).
 MARTIN O'DONOGHUE, *Economic Dimensions in Education* (Gill and Macmillan, 1971, £2.25.).

THE *British Economy Survey* is a bold and welcome enterprise launched by Oxford University Press and an Economics Association team. It is to be published three times a year and is aimed at the high growth market of economics students in sixth forms and further education. With ten

articles of roughly 1,500 words apiece, and a statistical supplement, it covers major areas of the syllabus.

Up dating of knowledge is a prime concern and authors rely heavily on surveying recent official publications and the quality press. The material is largely factual, not opinionated and provocative like *The Economist*, nor closely and insistently argued like the *National Institute Economic Review*. The quality of writing is a little variable but the survey should be a boon to students, for it is pitched at an appropriate level and benefits in numerous ways from being written by their teachers.

Dr. O'Donoghue's text on the economics of education really is accessible, in terms of language and analysis, to non-economists. It is more introductory than Professor Blaug's *Introduction to the Economics of Education*. With both books, those who do know some economics will gain even more, but because of its greater depth Blaug's book, at a paperback price of £1.00, is a formidable competitor.

In many parts Dr. O'Donoghue provides a perceptive, balanced and intelligible analysis and a shrewd review of some of the chief literature. But as a whole the book has two important drawbacks. First, as an introductory text, it is not as comprehensive as the publishers claim, particularly on the microeconomic side. Moreover, educational planning and common education market conditions like monopoly and monopsony are not very adequately treated. Virtually all work done since 1967 (some of it very important) is ignored, and there is no guidance on further reading.

The second drawback is that Dr. O'Donoghue's exemplification of the economic approach to education may leave readers with the impression that economics is a calculus designed merely to maximise the achievement of economic (= materialist) objectives. There are exceptions, notably in his discussion of cost-effectiveness studies, but in general there is some doubt whether the economic dimension will be recognized by non-economists as a technique of thinking which can be applied to means-ends problems in education irrespective of the nature of the ends.

K. B. DRAKE

E. A. PEEL, *The Nature of Adolescent Judgment* (Staples Press, 1972, £2.25).

JUDGMENT is perhaps the most important intellectual outcome of education, and a developed judgment in adolescents should represent the culmination and crowning achievement of the period of compulsory schooling. Professor Peel's work may have been inspired by the studies of Inhelder and Piaget, but it undoubtedly breaks fresh ground and draws attention to aspects of education which have been too long neglected.

The book bears the imprint of an author well versed in a number of

different but related fields. Firstly he is a psychologist of insight and subtlety, and the reader frequently encounters fresh points of view, or commonly accepted views presented in a new and challenging way. For example he remarks that any situation which provokes thought and judgment has in it an element of the unexpected, the dissonant, the cognitively out-of-equilibrium. Hence judgment has its origin in the motivations of curiosity and interest. Curiosity itself is analysed into an uninformed type aroused by strange phenomena, objects and situations, and a longer-term ideational curiosity impelled by the serious pursuit of understanding.

Secondly, as would be expected in a confirmed experimentalist, such psychological insights are never presented in isolation but are closely related to experimental procedure which either provides the evidence or suggests the means to substantiate them. The author himself and his students at Birmingham over the last ten years provide from their experimental work substantial support for the views expressed in the work. The central chapter is perhaps number four, in which a detailed analysis is given of the process of making a judgment, and this is backed by sufficient experimental results to authenticate the analysis. The next chapter entitled 'Insight into the dynamics of stability and change' is more speculative. Here emphasis passes from the psychological to some of the logical aspects of judgment. Some concepts from current physical science are also used in the chapter to throw new light on intellectual structuring. In other important chapters consideration is given to the factors which affect judgment and to categories according to which judgments may be evaluated. The authenticity of the categories is supported by the recurrent relationship demonstrated between level of judgment and mental age, while the analysis of variables affecting judgment is both searching and comprehensive. The skill shown in submitting the various aspects of the judgment process to experimental verification should encourage other workers to expand the work begun here.

Finally, the author is perhaps first and foremost an educator. His findings should provide teachers with fresh understanding of the nature of judgment and renewed confidence in the possibility of developing in their pupils this most difficult and important of all intellectual skills. Guidance is given to teachers not only in chapter six (the formal presentation of various experimental methods which have been employed to develop children's powers of judgment) but even more tellingly in the occasional thoughtful aside. For example on page 84, in the course of describing an interesting experiment with a problem in practical chemistry, comes the remark 'Teachers at all levels tend to streamline the learning process by presenting the most acceptable hypothesis and neglecting to eliminate the remainder . . . teachers should not forget that it is part of their task to promote thinking and that the complete act of suggesting a best judgment entails rejecting the others.'

This is a seminal book. It deserves to be read and pondered by the practising teacher and by the educational psychologist. Above all it points the way to new areas of research which, it is to be hoped, will be explored along the experimental lines so ably exemplified by the author.

J. E. NESBITT

ANDREW WILKINSON. *The Foundations of Language* (O.U.P., 1971, £0.50p).

EDITORIAL modesty requires me to appraise this book in a mere 400 words so there can be little more than a few assertions.

At lowest, it is important because it is already selling well, and to students. They are getting, at the price, very good value for money. The value they are getting is a readable, comprehensive account of current thinking about language as relevant to education. This means specifically a recognition of the importance of language as a principal medium of teaching, and as a principal medium of learning, and a recognition that these two processes are not just converses nor complementary, but, linguistically at least, both.

This is not a technical treatise, in the sense that any one aspect of the book is likely to be of interest to the specialist student of that aspect—psychology, literature, linguistics or sociology—as a source of information in that discipline. That, precisely, indicates its value: it is an inter-disciplinary book, so that any specialist is likely to find his own specialism treated rather summarily; but a teacher or intending teacher will find these studies raided for what is relevant in the classroom (with a useful directive bibliography). The resultant reading is more than a little breathless, but this was a job that needed doing and has been most usefully done well, and at the right level.

At this time, any book on language attempting to appeal to a fairly wide audience, must assume that that audience (being in part the product of teaching that implicitly adopts certain attitudes towards language that have been in need of and are now getting fresh evaluation) has certain notions about language that can be conveniently referred to (not entirely derogatorily) as a 'folk linguistic'. It is not easy to become aware of such of these notions as we ourselves hold, to begin to evaluate them, and to decide upon appropriate subsequent action. Even when we accept new ideas or formulations intellectually, our sense of own identity is so deeply involved in our language, and in our awareness of and attitude to language, that as in many other things 'we know the better and follow the worse.' Engendering more productive attitudes to language in education may perhaps take several generations, but this book helps to do so by bringing together from different disciplines a number of facts that we must face and take into

account in order to achieve them, and without bullying or hectoring it leaves us to consider our behaviour.

There is an interest in elephants, who are in the end most unfairly dubbed 'cynical' (p. 191). They must have been dogs.

MARTIN DAVIES

BRIAN BROCKLEHURST, *Response to Music* (Routledge & Kegan Paul, 1971, £1.40).

SINCE Dr. Brocklehurst produced his *Music in Schools* in 1962, music-teaching has been involved in the ferment (turmoil, if you like) which it is hoped will revitalise education as a whole, and many of the assumptions which he and anyone else could then make have been challenged and in some cases undermined. At that time, for instance, he could without qualm devote a section to *Singing in Assembly*, postulating that there would be assemblies, mostly involving virtually the whole of most schools, as a normal part of the day, and that the singing of Christian hymns would be a customary and important part of the proceedings. But since then we have seen considerable shifts in the whole climate of opinion, sweeping changes in school organisation, and the generation of strong pressures for the weakening of subject demarcations in favour of 'integrated approaches', for heuristic methods with emphasis on 'creativity', and for radical changes in the role of teachers. Changes in music itself have also become more apparent, so that whereas the teacher in the early sixties was sure that precision, control and logic were characteristics of his art, he has within the last few years had to take cognisance of an increasing body of material in which these elements play a smaller part or are virtually rejected in favour of sound-doodling and other explorations. In consequence of all this, and the fashionable esteem of the 'new' and derogation of the 'traditional' or 'old', some older teachers who knew where they were a decade ago have lost their bearings, and some younger ones have perhaps never yet found any.

Response to Music is Dr. Brocklehurst's contribution towards a solution of our problems. He ranges through sociology, psychology and general educational theory, discusses the educational values of music and the way they and changing social conditions should influence our aims in teaching, examines some of the main factors affecting people's responses to music, and lists and discusses the concepts and skills which he believes the pupil should be helped to acquire. *En route*, he raises almost every current issue in music education, often summarising prevalent views about the various topics. Unfortunately, the price paid for this comprehensiveness within 133 pages is an over-compressed style, and the not infrequent use of insufficiently-explained terms, as for instance in the following:

Walker's system of analysis, based on the unity of contrasting themes theory, and Keller's wordless functional analysis, which involves the reconstruction of a score to bring out its latent unity, represent attempts to give due emphasis to the expressive function of musical form.

It seems a great pity that the author had not the space to expand and, in places, illustrate. However, although it seems likely that many pages will not be easy reading to the uninitiated, the book abounds in statements and passages which would make admirable starting points for seminars, and it will probably be read and re-read with increasing benefit as the reader's practical experience grows. The chapter bibliographies are a valuable feature.

KENNETH SIMPSON

S. HILSUM, B.S. CANE, *The Teacher's Day* (National Foundation for Educational Research, £3.80).

It has long been a lament of some educationalists that since we don't really know what a teacher does, it is impossible either to evaluate a teacher's performance realistically or to design adequate training courses for a role which eludes precise definition. This book may not still their cries but it should, on careful examination, point the way towards a conceptual analysis of teaching which is sadly lacking at the present time.

One hundred and twenty nine teachers in 66 junior schools in the county of Surrey were observed *in situ* for three school days each. Their evenings, weekends and holiday periods were analysed on the basis of self-report diaries. The result is not a sensational revelation of what commonsense had denied to sober observers already, but a sound and carefully documented analysis of what a teacher actually does. In particular the research focuses attention on the disproportionate amount of time spent by a teacher in tasks other than 'pure' instructional ones, as well as on the fact that a large part of the teacher's day consists of professional activities outside his own classroom.

As the authors realise, their work needs replication with samples covering dissimilar age ranges and in different geographical areas. One quirk, for example, which they do not comment upon is that Surrey has a much larger-than-average private sector of education—inevitably depriving the state schools of their 'normal' share of able and less-able children. It is unlikely that this factor affects the results crucially but it reinforces the need for replication.

Here then is a truly original piece of research, concerned with the personal encounter between adult and child in the context of the school, an activity which is, after all, the *raison d'être* of the educational system. A

pity therefore that the high price will not endear it to class teachers, though the cynic might say that they are least in need of it (since, individually, their ability to change the status quo may be limited). This is surely one report that should appear in a condensed version at a lower price. Otherwise its findings may not be as widely disseminated as they deserve to be.

GERALD CORTIS

J. W. TIBBLE (Ed.), *The Future of Teacher Education* (Routledge & Kegan Paul, 1971, £2).

WITH the advent of the James' Committee comes a spate of books on teacher education of which this volume may be taken as representative. The contributions, with one exception, fall into the developmental and the descriptive. Craft sees a broader role for the colleges in their developing liberal arts and/or interpersonal studies and also examines the political implications of change. Hewett observes that only in full partnership, in a federated university structure, will the colleges enable the teaching profession to 'come in from the cold'. Tuck outlines a 'sandwich' plan for the organisation of a two-year postgraduate course, wisely recognising that prolongation only ensures improvement insofar as new concepts accompany new structures. Meighan and Chambers, in a fresh and engaging paper, similarly argue for a 'sandwich' scheme for initial entrants. They feel that any initiation of new programmes should be in at in-service level rather than in 'liberal arts colleges or multiversities'.

The descriptive element is sound, though dealing more with the present than the future. No one will quarrel with Renshaw's overall aim of the college curriculum, to produce teachers '... sensitive, self-confident, self-critical and adaptable'. Chambers writes stimulatingly about the ambivalent role of the education lecturer, everywhere caught in a conflicting web of demand and response, hurrying to mount the current bandwagon or dismount from it. His paper reflects feelingly the hurly burly of college educational studies past, present and perhaps to come. Eason, in reminding us that three-quarters of college lecturers have a subject other than education, provides some much needed balance in reviewing main subjects, an area which has too often lacked articulate spokesmen. Tibble, ever cogent and lucid in style, is perhaps a little disappointing on 'school practice' in that he largely recapitulates existing material.

Finally Cane, the *enfant terrible* of teacher education, enjoys the transition from researcher to revolutionary in a trenchant and persuasive, indeed at times hectoring, paper on 'in-service education'. He advocates the virtual abolition of present university institutions and the establishment of 'universities of teachers ... the third force in British higher education'.

Whether this book justifies its claim to be 'an important contribution to

the debate on higher education' will depend on where the individual reader stands. As with all 'composite' books the pattern is uneven but, though the cognoscenti may find it politically naive, a general reader will be the better informed for reading it. Perhaps some of the contributors deliberately omitted any discussion of the politics of their briefs, so as not to reveal their position in advance of any confrontation with the higher powers. One hopes so, for if teacher education is not to be ascribed inferior status in the future it will largely be because its practitioners showed keen political awareness in achieving educational ends.

GERALD CORTIS

B. O. SMITH (Ed.), *Research in Teacher Education: A Symposium* (Prentice-Hall Inc., 1971, £3).

BECAUSE teacher education in this country has long been in a state, primarily, of intuitive as distinct from empirical operation, this symposium should be welcomed by those who assert that the latter quality should predominate.

In reviewing the conceptual foundations Turner argues convincingly for the establishment of demonstrably valid relationships between performance criteria in teaching and the type of experiences American students undergo. Rosenshine and Furst note that the model programmes advanced by teacher educators have little 'relevance for the real world'. About heuristic teaching McDonald concedes, rather depressingly, that 'so little is known one can begin anywhere and make progress'.

A thorough review of the literature characterises Peck's paper on 'promoting self-disciplined learning'. He sees the need to avoid treating classes 'as passive teacher-controlled units in an almost faceless mob' and produces a defensible model of how more effective interaction between teacher and pupil may be promoted. Loree on 'shaping teachers' attitudes' makes a valuable contribution in assessing an area in which some demonstrable evidence is to hand as to the effect of particular instructional sequences on student teachers' attitudes.

Finally, Clarke reviews some major publications delineating American teacher education programmes and isolating some common features.

The jargon and general unevenness of the contributions will probably prevent a reader taking the technical expertise displayed by some contributors as gospel, which may be no bad thing. If one can get behind much of the 'educanto' there is some useful material which throws light on our own problems. But the style of the contributors militates against the book's true worth. This is a pity. The research worker who cannot communicate effectively is of limited utility no matter how good his experimental techniques may be.

GERALD CORTIS

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THE QUALITY OF UNDERSTANDING IN SECONDARY SCHOOL SUBJECTS

EDITED BY E. A. PEEL

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